

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: TRONZ, INC Examiner #: 69332 Date: 5/9/03
 Art Unit: 1711 Phone Number 301-7437 Serial Number: 10/042,357
 Mail Box and Bldg/Room Location: _____ Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

Earliest Priority Filing Date: _____

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Filler on formula in claim 3, or 4. Thanks.

STAFF USE ONLY

Type of Search		Vendors and cost where applicable
Searcher: <u>EL</u>	NA Sequence (#) _____ STN _____	<u>\$ 154.56</u>
Searcher Phone #: _____	AA Sequence (#) _____	
Searcher Location: _____	Structure (#) <u>(3)</u> <u>Dialog</u> <u>(subsets)</u>	
Date Searcher Picked Up: _____	Bibliographic <u>(and)</u> <u>Questel/Orbit</u> <u>Link</u>	
Date Completed: <u>5-14-03</u>	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: <u>5</u>	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>65</u>	Other _____	Other (specify) _____

=> file reg

FILE 'REGISTRY' ENTERED AT 10:46:29 ON 14 MAY 2003
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FILE 'LREGISTRY' ENTERED AT 09:14:46 ON 14 MAY 2003

L1 STR
L2 STR

FILE 'REGISTRY' ENTERED AT 09:33:04 ON 14 MAY 2003
ACT TRU359/A

L3 STR
L4 SCR 2043
L5 5792 SEA FILE=REGISTRY SSS FUL L3 AND L4

L6 13 S L1 AND L2 SSS SAM SUB=L5
L7 185 S L1 AND L2 SSS FUL SUB=L5
SAV L7 TRU357/A
L8 175 S L7 NOT 2<NC
L9 31 S L8 AND 2/NRS
L10 144 S L8 NOT L9

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L11 0 S L9
L12 0 S L10

FILE 'ZCA' ENTERED AT 09:42:24 ON 14 MAY 2003

L13 57 S L9
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L15 51 S L13 AND (1907-2001/PY OR 1907-2001/PRY)
L16 112 S L14 AND (1907-2001/PY OR 1907-2001/PRY)

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L18 160845 S LIU ?/AU
L19 41537 S JIANG ?/AU
L20 9254 S QI ?/AU
L21 103747 S WU ?/AU
L22 0 S L17 AND L18 AND L19 AND L20 AND L21
L23 91 S L17 AND L18
L24 9 S L17 AND L19
L25 6 S L17 AND L20
L26 62 S L17 AND L21
L27 5028 S L18 AND L19
L28 1312 S L18 AND L20
L29 10144 S L18 AND L21
L30 376 S L19 AND L20

L31 2927 S L19 AND L21
L32 785 S L20 AND L21
L33 5260 S POLYTHIOPHENE# OR POLY(A)THIOPHENE#
L34 4 S (L23-L32) AND L33
SEL L34 1-4 RN

FILE 'REGISTRY' ENTERED AT 09:51:28 ON 14 MAY 2003

L35 27 S E1-E27
L36 8 S L35 AND L5
SAV L36 TRU357AU/A
L37 0 S L35 AND L7

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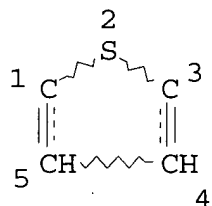
L38 2 S L34 AND DEVICE#

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L40 0 S L15 AND L39
L41 14 S L16 AND L39
L42 14 S L41 NOT L15

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=> d l7 que stat
L1 STR,



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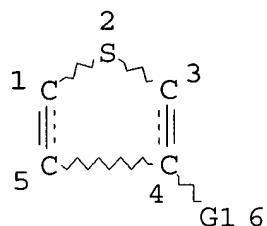
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DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:

RSPEC I
NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE

L2 STR



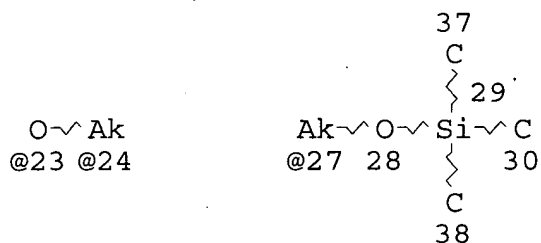
Ak @7

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Ak~G2~O
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Page 1-A



Page 1-B

VAR G1=7/10/14/19/27

REP G2=(1-10)· 23-19 24-21

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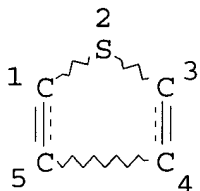
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NUMBER OF NODES IS 23

STEREO ATTRIBUTES: NONE

L3 STR



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 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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 NUMBER OF NODES IS 5

STEREO ATTRIBUTES: NONE
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 L5 5792 SEA FILE=REGISTRY SSS FUL L3 AND L4
 L7 185 SEA FILE=REGISTRY SUB=L5 SSS FUL L1 AND L2

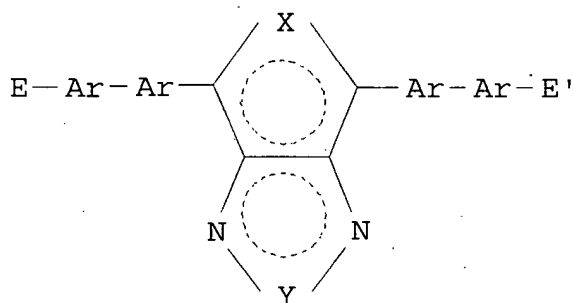
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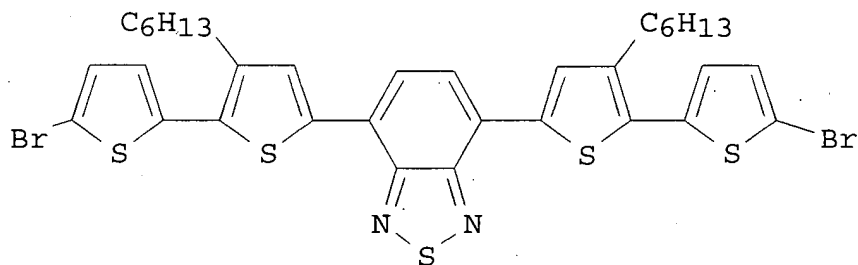
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L42 ANSWER 1 OF 14 ZCA COPYRIGHT 2003 ACS
 137:140902 Monomer for use in preparation of a polymer to be used in optical devices. Burroughes, Jeremy; Towns, Carl; Pounds, Thomas; Halls, Jonathan (Cambridge Display Technology Limited, UK). PCT Int. Appl. WO 2002059121 A1 20020801, 48 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-GB294 20020123. PRIORITY: GB 2001-1824 20010124; GB 2001-14538 20010614; US 2001-PV310588 20010807.

GI



I.



II

AB The title monomer comprises I which may be substituted or unsubstituted: where E and E are the same or different and are reactive groups capable of undergoing chain extension; X is O, S, NR₅, R₅C-CR₆ or R₅C=CR₆; Y is O, S, NR₇, R₇C-CR₈ or R₇C=CR₈; R₅, R₆, R₇ and R₈ are the same or different and each is independently H or a substituent group; and each Ar is the same or different and is independently a substituted or unsubstituted aryl or heteroaryl group. II was prepd. and polymd. with 9,9-di-n-octylfluorene-2,7-diethyleneboronate to give a polymer useful in **electroluminescent** devices.

IT 444579-46-8P 444579-47-9P

(monomer for use in prepn. of a polymer to be used in optical devices)

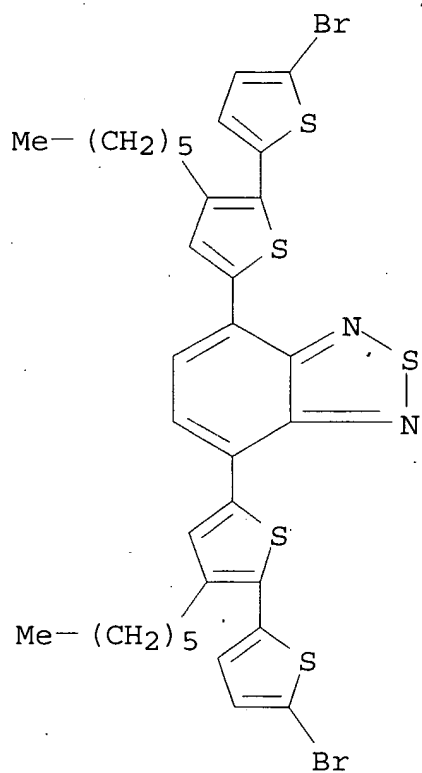
RN 444579-46-8 ZCA

CN 2,1,3-Benzothiadiazole, 4,7-bis(5'-bromo-3-hexyl[2,2'-bithiophen]-5-yl)-, polymer with 9,9-dioctyl-9H-fluorene (9CI) (CA INDEX NAME)

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CRN 444579-41-3

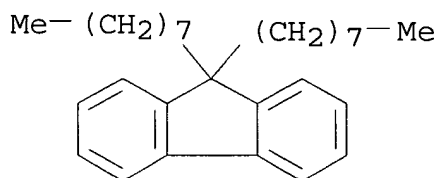
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CM 2

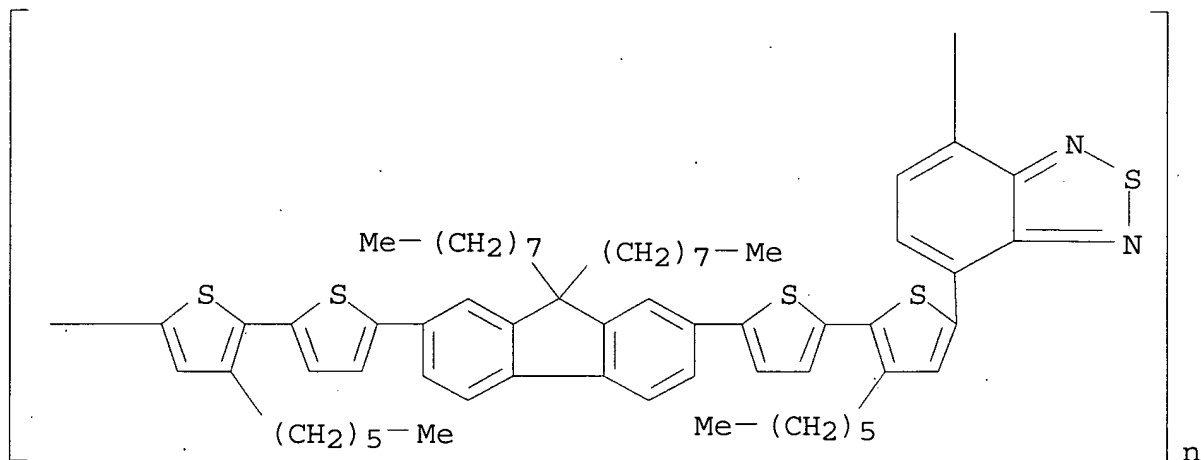
CRN 123863-99-0

CMF C29 H42



RN 444579-47-9 ZCA

CN Poly[2,1,3-benzothiadiazole-4,7-diyl(3-hexyl[2,2'-bithiophene]-5,5'-diyl)(9,9-dioctyl-9H-fluorene-2,7-diyl)(3'-hexyl[2,2'-bithiophene]-5,5'-diyl)] (9CI) (CA INDEX NAME)



- IC ICM C07D417-14
ICS C08G061-10; C09K011-06; H01L051-20
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 73
IT **Electroluminescent** devices
Optical instruments
Photoelectric devices
(monomer for use in prepn. of a polymer to be used in optical devices)
IT **444579-46-8P 444579-47-9P**
(monomer for use in prepn. of a polymer to be used in optical devices)

L42 ANSWER 2 OF 14 ZCA COPYRIGHT 2003 ACS

136:6457 Synthesis of Poly(cyclodiborazane)s by Hydroboration Polymerization of Dicyanooligothiophenes and Their **Light-Emitting** Properties. Miyata, Mamoru; Matsumi, Noriyoshi; Chujo, Yoshiki (Department of Polymer Chemistry, Graduate School of Engineering Kyoto University, Yoshida Sakyo-ku Kyoto, 606-8501, Japan). *Macromolecules*, 34(21), 7331-7335 (English) **2001**. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB Hydroboration polymn. of dicyanooligothiophenes bearing various nos. of thiophene repeating units gave the corresponding .pi.-conjugated poly(cyclodiborazane)s having oligothiophene units, and their **light-emitting** properties were studied. The polymn. was carried out by adding a THF soln. of mesitylborane (or tripylborane) to a suspension of dicyanooligothiophene monomer in THF at room temp. under nitrogen. The reaction mixt. was stirred overnight, and the polymer was isolated by repptn. as a powder. These polymers were sol. in common org. solvents such as THF and chloroform, and stable under air and water. In UV-vis absorption spectra and fluorescence emission spectra of the polymer solns., their absorption and emission maxima were bathochromic shifted as

the no. of thiophene repeating units increased. The **light-emitting** properties of the poly(cyclodiborazane)s were successfully controlled in this way.

IT 374588-94-0P 374588-95-1P 374588-97-3P
374588-98-4P

(synthesis of poly(cyclodiborazanes) by hydroboration polymn. of dicyanooligothiophenes and their **light-emitting** properties)

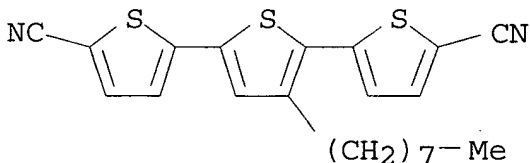
RN 374588-94-0 ZCA

CN [2,2':5',2''-Terthiophene]-5,5''-dicyanonitrile, 3'-octyl-, polymer with (2,4,6-trimethylphenyl)borane (9CI) (CA INDEX NAME)

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CRN 374588-93-9

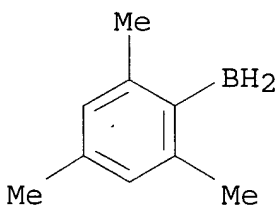
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CM 2

CRN 45741-00-2

CMF C9 H13.B



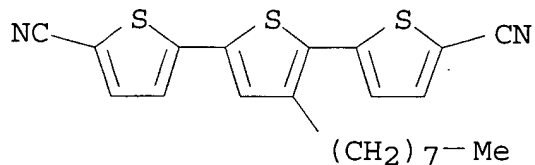
RN 374588-95-1 ZCA

CN [2,2':5',2''-Terthiophene]-5,5''-dicyanonitrile, 3'-octyl-, polymer with [2,4,6-tris(1-methylethyl)phenyl]borane (9CI) (CA INDEX NAME)

CM 1

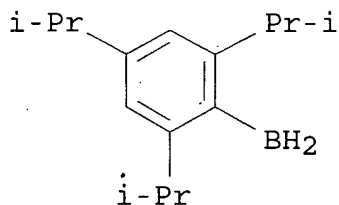
CRN 374588-93-9

CMF C22 H22 N2 S3



CM 2

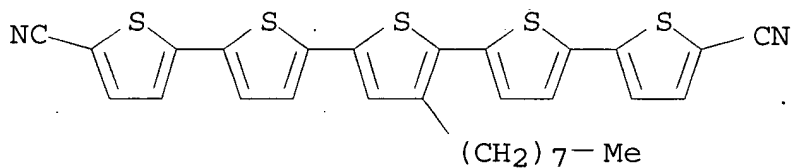
CRN 145434-23-7
CMF C15 H25 B



RN 374588-97-3 ZCA
CN [2,2':5',2'':5'',2''':5''',2''''-Quinquethiophene]-5,5''''-dicarbonitrile, 3'''-octyl-, polymer with (2,4,6-trimethylphenyl)borane (9CI) (CA INDEX NAME)

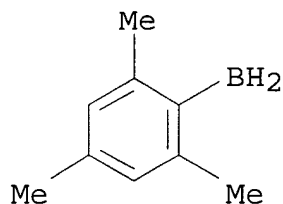
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CRN 374588-96-2
CMF C30 H26 N2 S5



CM 2

CRN 45741-00-2
CMF C9 H13 B



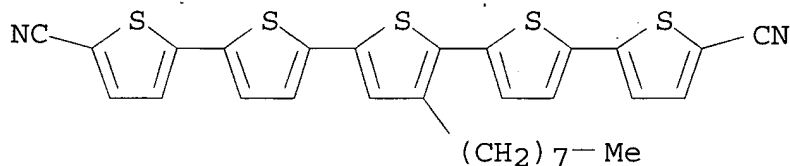
RN 374588-98-4 ZCA

CN [2,2':5'',2''':5''',2''':5''',2''':5'''-Quinquethiophene]-5,5''''-dicarbonitrile, 3''-octyl-, polymer with [2,4,6-tris(1-methylethyl)phenyl]borane (9CI) (CA INDEX NAME)

CM 1

CRN 374588-96-2

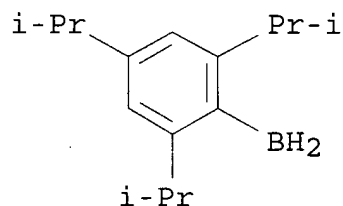
CMF C30 H26 N2 S5



CM 2

CRN 145434-23-7

CMF C15 H25 B



CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 36, 73

IT Polymers, preparation

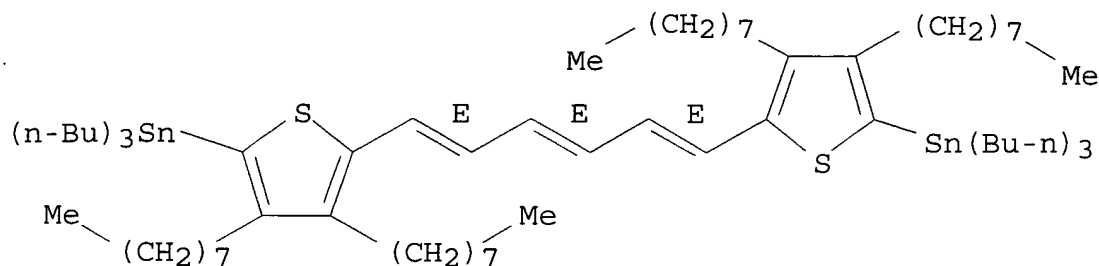
(conjugated; synthesis of poly(cyclodiborazanes) by hydroboration polymn. of dicyanooligothiophenes and their **light-emitting** properties)

IT Polymerization

(hydroboration; synthesis of poly(cyclodiborazanes) by hydroboration polymn. of dicyanooligothiophenes and their **light-emitting** properties)

- IT Conducting polymers
(polythiophenes; synthesis of poly(cyclodiborazanes) by hydroboration polymn. of dicyanooligothiophenes and their **light-emitting** properties)
- IT Fluorescence
Thermal stability
(synthesis of poly(cyclodiborazanes) by hydroboration polymn. of dicyanooligothiophenes and their **light-emitting** properties)
- IT 15525-20-9DP, Cyclodiborazane, polymers, derivs. 374588-89-3P
374588-90-6P 374588-91-7P 374588-92-8P **374588-94-0P**
374588-95-1P 374588-97-3P 374588-98-4P
(synthesis of poly(cyclodiborazanes) by hydroboration polymn. of dicyanooligothiophenes and their **light-emitting** properties)
- L42 ANSWER 3 OF 14 ZCA COPYRIGHT 2003 ACS
- 135:5936 Synthesis and optical properties of (thienylene)-[1,6-dithienylhexa-1,3,5-trienylene] copolymers. Embert, Franck; Lere-Porte, Jean-Pierre; Moreau, Joel J. E.; Serein-Spirau, Francoise; Righi, Arieta; Sauvajol, Jean-Louis (Heterochimie Moleculaire et Macromoleculaire, UMR CNRS 076, E.N.S.C.M., l'Ecole Normale, Montpellier, 34296, Fr.). Journal of Materials Chemistry, 11(3), 718-722 (English) 2001. CODEN: JMACEP. ISSN: 0959-9428. Publisher: Royal Society of Chemistry.
- AB Two [thiophene-1,6-dithienylhexa-1,3,5-triene] copolymers were prepd. by a palladium catalyzed coupling reaction of 2,5-dibromothiophene (I) or 2,5-dibromo-3-octylthiophene (II) and a bis(tributylstannyl) deriv. of a 1,6-dithienylhexa-1,3,5-triene unit. The electrochromism and the photoluminescence properties of the highly conjugated polymers were studied. In the solid state the polymers have strong photoluminescence bands at 2.0 eV (from II) and 1.95 eV (from I). The polymer from I seems particularly promising for use as a red-**light emitting** diode, and both polymers exhibit red-pale blue electrochromism that makes them suitable for fabricating new devices.
- IT **340702-40-1P**
(prepn. and electrochromism and photoluminescence of thiophene deriv. polymers)
- RN 340702-40-1 ZCA
- CN Stannane, [[(1E,3E,5E)-1,3,5-hexatriene-1,6-diyl]bis(3,4-dioctyl-5,2-thiophenediyl)]bis[tributyl-, polymer with 2,5-dibromothiophene (9CI) (CA INDEX NAME)
- CM 1
- CRN 340702-39-8
- CMF C70 H128 S2 Sn2

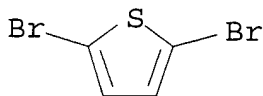
Double bond geometry as shown.



CM 2

CRN 3141-27-3

CMF C4 H2 Br2 S

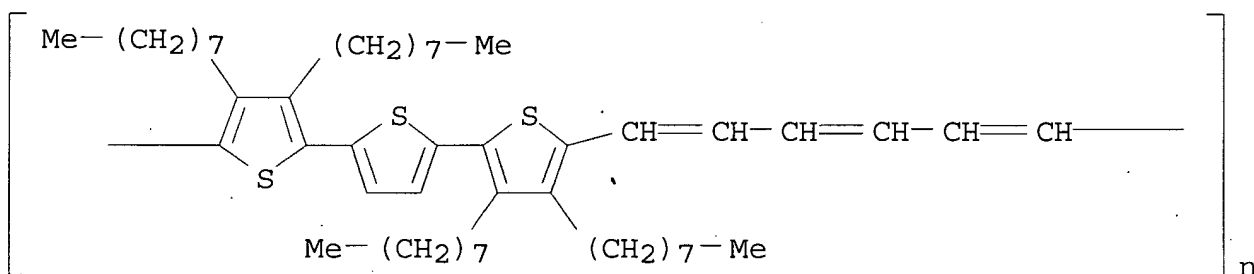


IT 340702-42-3P

(prepn. and electrochromism and photoluminescence of thiophene deriv. polymers)

RN 340702-42-3 ZCA

CN Poly[(3,3'',4,4''-tetraoctyl[2,2':5',2''-terthiophene]-5,5''-diyl)-(1E,3E,5E)-1,3,5-hexatriene-1,6-diyl] (9CI) (CA INDEX NAME)



CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 27, 38, 72, 73

IT Electroluminescent devices

(red-emitting; red light-emitting diodes with thiophene deriv. polymers)

IT 340702-40-1P

(prepn. and electrochromism and photoluminescence of thiophene deriv. polymers)

IT 340702-41-2P 340702-42-3P 340960-78-3P

(prepn. and electrochromism and photoluminescence of thiophene deriv. polymers)

IT 50926-11-9, Indium tin oxide

(red **light-emitting** diodes with thiophene deriv. polymers)

L42 ANSWER 4 OF 14 ZCA COPYRIGHT 2003 ACS

133:105428 Novel photoluminescent polymers containing oligothiophene and m-phenylene-1,3,4-oxadiazole moieties: synthesis and spectroscopic and electrochemical studies. Meng, Hong; Huang, Wei (Institute of Materials Research and Engineering, National University of Singapore, Singapore, 117602, Singapore). Journal of Organic Chemistry, 65(13), 3894-3901 (English) 2000. CODEN: JOCEAH. ISSN: 0022-3263. Publisher: American Chemical Society.

AB Three conjugated polymers contg. oligothiophene units (from one to three thiophene rings) and arom. 1,3,4-oxadiazole moieties have been synthesized. The polymer structures were characterized and confirmed by ^1H and ^{13}C NMR and FT-IR spectra and elemental anal. TGA demonstrated that the polymers are very thermally stable. Tunable absorption (from 342 to 428 nm) and fluorescence (from 411 to 558 nm) properties of polymers were obsd. Electrochem. investigation indicated that the LUMO and HOMO energy levels of the new polymers could be adjusted. It was also revealed by the electrochem. anal. that the polymers have good charge injection properties for both p-type and n-type charge carriers, as well as good color-tunable luminescence and film-forming properties, which makes them potentially useful for fabricating efficient **light-emitting** devices.

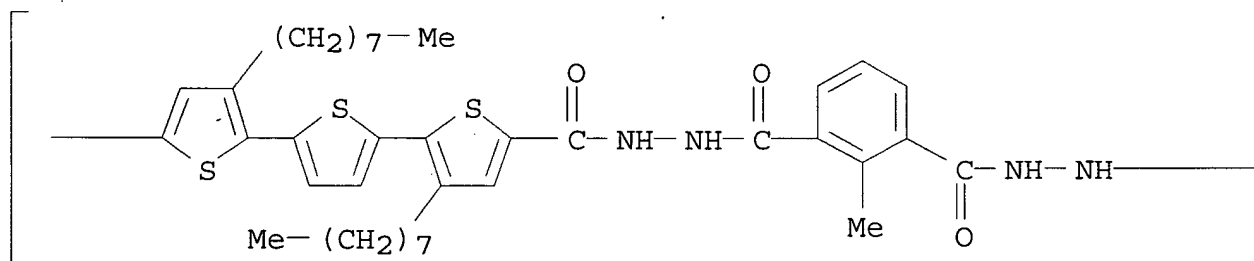
IT 216773-44-3P

(polyhydrazide precursor; prepn. of photoluminescent polythiophene-polyoxadiazoles)

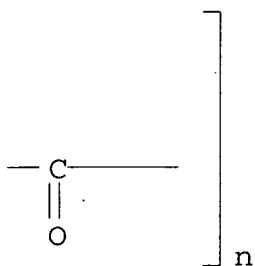
RN 216773-44-3 ZCA

CN Poly[(3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-diyl)carbonylhydrazocarbonyl(2-methyl-1,3-phenylene)carbonylhydrazocarbonyl] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



IT 216773-04-5P 283610-21-9P

(prepn. of photoluminescent polythiophene-polyoxadiazoles)

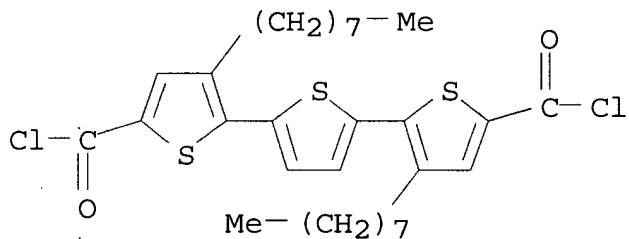
RN 216773-04-5 ZCA

CN 1,3-Benzenedicarboxylic acid, 2-methyl-, dihydrazide, polymer with
 3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-dicarbonyl dichloride
 (9CI) (CA INDEX NAME)

CM 1

CRN 215324-15-5

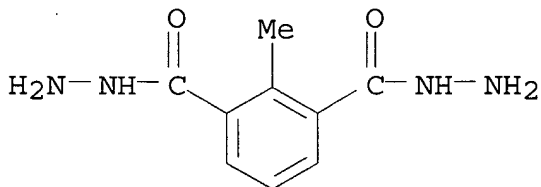
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CM 2

CRN 210779-36-5

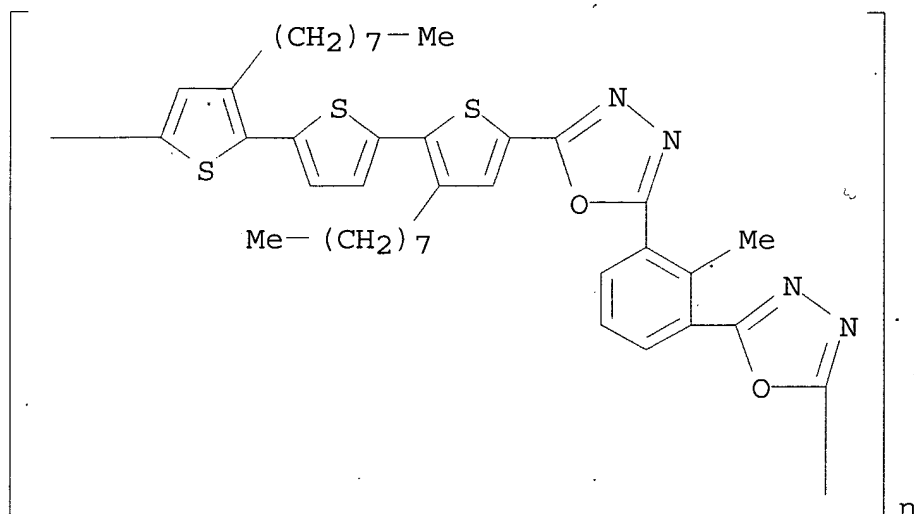
CMF C9 H12 N4 O2



RN 283610-21-9 ZCA

CN Poly[1,3,4-oxadiazole-2,5-diyl(2-methyl-1,3-phenylene)-1,3,4-
 oxadiazole-2,5-diyl(3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-

diyl)]. (9CI) (CA INDEX NAME)



- CC 35-5 (Chemistry of Synthetic High Polymers)
 Section cross-reference(s): 72, 73
- IT Cyclic voltammetry
 Electron affinity
 Fluorescence
 HOMO (molecular orbital)
 Ionization potential
 LUMO (molecular orbital)
 Luminescence, **electroluminescence**
 Oxidation potential
 Reduction, electrochemical
 (of photoluminescent polythiophene-polyoxadiazoles)
- IT **Electroluminescent** devices
 (photoluminescent polythiophene-polyoxadiazoles for)
- IT 210779-38-7P **216773-44-3P** 216973-16-9P
 (polyhydrazide precursor; prepn. of photoluminescent
 polythiophene-polyoxadiazoles)
- IT 210779-37-6P 210779-39-8P 216772-96-2P **216773-04-5P**
283610-21-9P 284036-09-5P
 (prepn. of photoluminescent polythiophene-polyoxadiazoles)
- L42 ANSWER 5 OF 14 ZCA COPYRIGHT 2003 ACS
 131:323145 Regioregular Di(2'-(thienyl))furan- and Di(2'-
 thienyl))benzene-Based Polymers: Steric and Heavy-Atom Effects on
 the Luminescence of Conjugated Systems. Yang, Cheng; Abley,
 Michael; Holdcroft, Steven (Department of Chemistry, Simon Fraser
 University, Burnaby, BC, V5A 1S6, Can.). Macromolecules, 32(20),
 6889-6891 (English) 1999. CODEN: MAMOBX. ISSN:
 0024-9297. Publisher: American Chemical Society.
- AB A systematic investigation of photoluminescence quantum yields
 (soln. and solid state) of regiochem. controlled polymers of
 1,4-di(2-hexylthienyl)benzene, 2,5-di(2'-hexylthienyl)furan, and

2,5-di[2'-(3'-hexylthienyl)thiophene] is reported. The polymers were prep'd. chem. oxidn. of the corresponding monomers in the presence of FeCl₃ in CCl₄. The UV-visible absorption and fluorescence spectra were measured for both the monomers and polymers. Fluorescence data and structure of solid polymers are discussed together with their suitability as materials for **light emitting** diodes.

IT 135831-09-3

(UV spectra and fluorescence of)

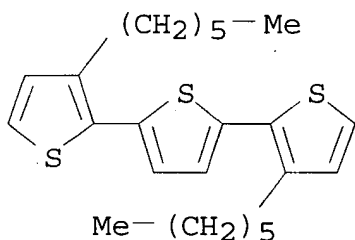
RN 135831-09-3 ZCA

CN 2,2':5',2''-Terthiophene, 3,3''-dihexyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 135831-08-2

CMF C24 H32 S3



CC 36-5 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 73

IT Phosphors

(**electroluminescent**; steric and heavy-atom effects on luminescence of regioregular di(2'-(thienyl))furan- and di(2'-thienyl))benzene-based polymers)

IT 135831-09-3 249575-17-5 249575-20-0 249575-21-1
249575-22-2

(UV spectra and fluorescence of)

L42 ANSWER 6 OF 14 ZCA COPYRIGHT 2003 ACS

130:139711 A Novel Series of p-n Diblock **Light-**

Emitting Copolymers Based on Oligothiophenes and

1,4-Bis(oxadiazolyl)-2,5-dialkyloxybenzene. Huang, Wei; Meng, Hong; Yu, Wang-Lin; Pei, Jian; Chen, Zhi-Kuan; Lai, Yee-Hing (Institute of Materials Research and Engineering and Department of Chemistry, National University of Singapore, Singapore, 119260, Singapore). *Macromolecules*, 32(1), 118-126 (English) 1999. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB A new series of p-n diblock conjugated copolymers consisting of alternate 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene and oligothiophenes with one to three thiophene rings (P1-P3) have been synthesized. The polymers have well-defined structures and exhibit good thermal stability with the onset decompn. temps. in nitrogen at

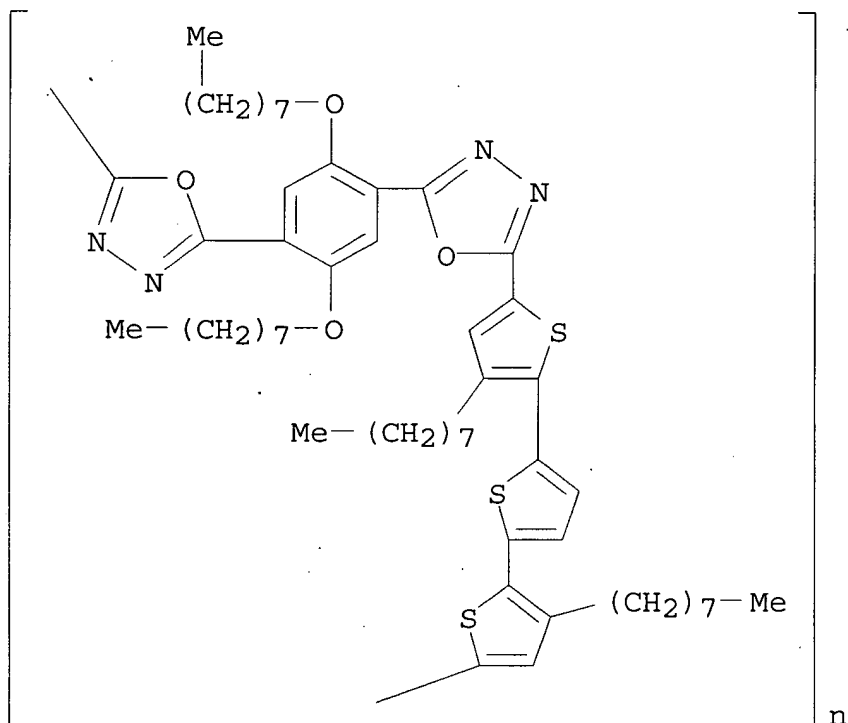
around 300 .degree.C. The glass transition temp. (Tg) of the polymers decreases with increasing the length of oligothiophene blocks. Both the absorption spectra and photoluminescence spectra shift to longer wavelength with increase in the length of oligothiophene blocks. The emissive color of the polymers could be tuned from blue to green to orange just by increasing the no. of thiophene rings in the oligothiophene blocks from one to three. No obvious change in redn. potential is found for the polymers with variation in the length of oligothiophene blocks. The redn. potential E1/2 of the polymers is measured by cyclic voltammetry to be around -1.7 V vs SCE, comparable to those of poly(cyanoterephthalydene) (CN-PPV) and other good electron-transporting materials. The oxidn. potential of the polymers can be reduced remarkably by increasing the length of oligothiophene blocks. The oxidn. potential E1/2 of P3 is measured to be 1.25 V with the onset potential at 1.0 V vs SCE. These values are comparable to those of some hole-injection favorable **electroluminescent** polymers. The results prove that the p-n diblock structure may be a promising mol. design for synthetically tuning the HOMO and LUMO of conjugated polymers.

IT 215324-20-2P

(prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)

RN 215324-20-2 ZCA

CN Poly[1,3,4-oxadiazole-2,5-diyl[2,5-bis(octyloxy)-1,4-phenylene]-1,3,4-oxadiazole-2,5-diyl(3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-diyl)] (9CI) (CA INDEX NAME)



IT 215324-16-6P 215324-18-8P

(prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)

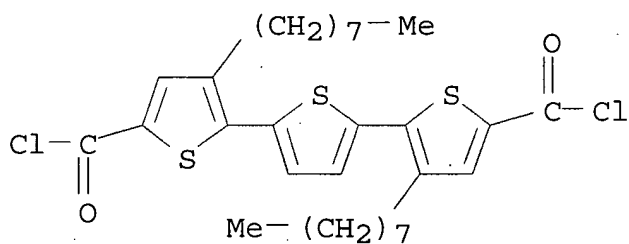
RN 215324-16-6 ZCA

CN 1,4-Benzenedicarboxylic acid, 2,5-bis(octyloxy)-, dihydrazide, polymer with 3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-dicarbonyl dichloride (9CI) (CA INDEX NAME)

CM 1

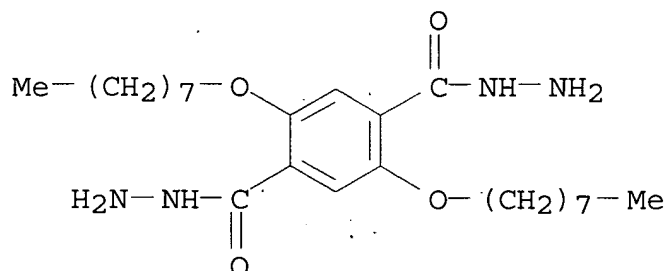
CRN 215324-15-5

CMF C30 H38 Cl2 O2 S3



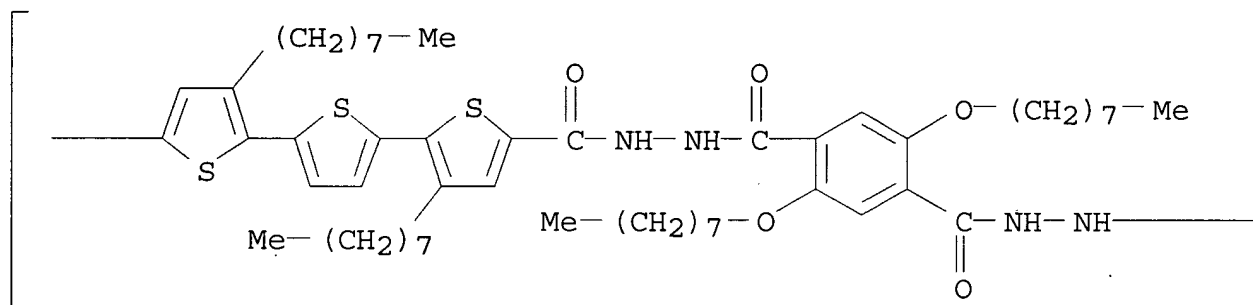
CM 2

CRN 215324-12-2
CMF C24 H42 N4 O4

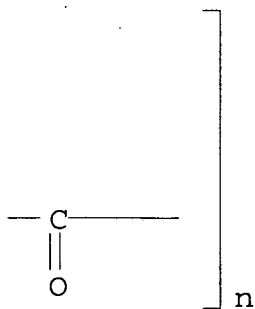


RN 215324-18-8 ZCA
CN Poly[(3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-diyl)carbonylhydrazocarbonyl[2,5-bis(octyloxy)-1,4-phenylene]carbonylhydrazocarbonyl] (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B



CC 35-5 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 36, 72, 73

- ST **light emitting** copolymer thiophene oxadiazole group; photoluminescence copolymer thiophene oxadiazole group; polyoxadiazole thiophene group prepn photoluminescence; polyhydrazide thiophene group prepn cyclodehydration
- IT Polymers, preparation
(conjugated; prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT Polyoxadiazoles
(polythiophene-; prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT Polyhydrazides
(polythiophenes; prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT Glass transition temperature
HOMO (molecular orbital)
LUMO (molecular orbital)
Luminescence
Luminescent substances
Oxidation potential
Reduction potential
UV and visible spectra
(prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT 215324-12-2P 215324-15-5P
(monomer; prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT 208445-55-0
(prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT 215324-20-2P 215443-40-6P 215721-58-7P 219931-19-8P
(prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT 215324-13-3P 215324-16-6P 215324-18-8P
215443-33-7P 219931-17-6P 219931-18-7P
(prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT 111-83-1, 1-Bromooctane 5870-38-2 7719-09-7, Thionyl chloride
7803-57-8, Hydrazine hydrate 65016-62-8, 3-n-Octylthiophene
216772-33-7
(reactant in monomer prepn.; prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)
- IT 126297-17-4P 145543-83-5P, 2-Bromo-3-octylthiophene 155166-89-5P

216772-47-3P

(reactant in monomer prepn.; prepn. and physicochem. properties of series of **light-emitting** copolymers based on oligothiophenes and 1,4-bis(oxadiazolyl)-2,5-dialkyloxybenzene)

L42 ANSWER 7 OF 14 ZCA COPYRIGHT 2003 ACS

130:52896 Tuning Redox Behavior and Emissive Wavelength of Conjugated Polymers by p-n Diblock Structures. Yu, Wang-Lin; Meng, Hong; Pei, Jian; Huang, Wei (Institute of Materials Research and Engineering, National University of Singapore, Singapore, 119260, Singapore). Journal of the American Chemical Society, 120(45), 11808-11809 (English) 1998. CODEN: JACSAT. ISSN: 0002-7863. Publisher: American Chemical Society.

AB The idea of p-n diblock structure in conjugated polymers affords an efficient approach of tuning emissive color of conjugated polymers. According to the electrochem. studies, it provides a promising synthetic route to adjust the HOMO and LUMO of **electroluminescent** polymers to balance the injections of electrons and holes from the opposite contacts. Intensive studies on the charge transporting properties of these polymers in polymeric LED devices are in progress.

IT **215324-16-6P**, 2,5-Dioctyloxyterephthalic dihydrazide-3,3''-dioctyl-2,2':5',2''-terthiophene-5,5''-dicarbonyl dichloride copolymer **215324-18-8P**, 2,5-Dioctyloxyterephthalic dihydrazide-3,3''-dioctyl-2,2':5',2''-terthiophene-5,5''-dicarbonyl dichloride copolymer, sru **216773-04-5P**, 3,3''-Dioctyl-2,2':5',2''-terthiophene-5,5''-dicarbonyl dichloride-2,6-toluenedicarbonyl hydrazide copolymer **216773-44-3P**

(tuning redox behavior and emissive wavelength of conjugated polymers by p-n diblock structures)

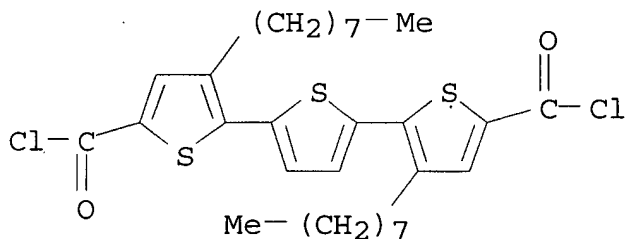
RN 215324-16-6 ZCA

CN 1,4-Benzenedicarboxylic acid, 2,5-bis(octyloxy)-, dihydrazide, polymer with 3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-dicarbonyl dichloride (9CI) (CA INDEX NAME)

CM 1

CRN 215324-15-5

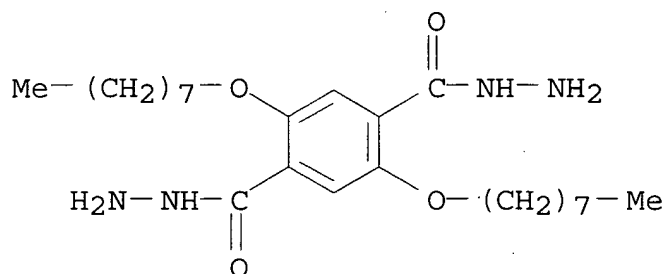
CMF C30 H38 Cl2 O2 S3



CM 2

CRN 215324-12-2

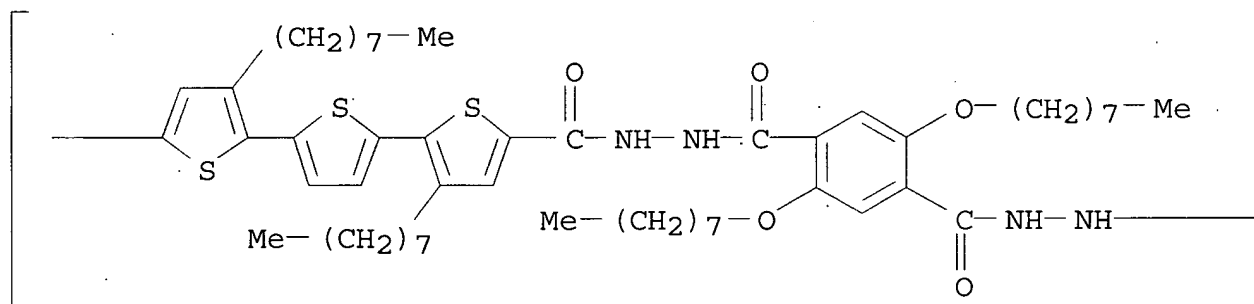
CMF C24 H42 N4 O4



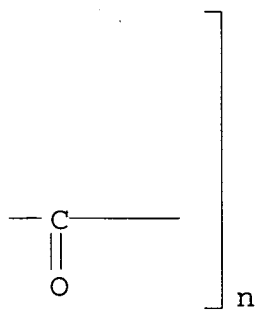
RN 215324-18-8 ZCA

CN Poly[(3,3'-dioctyl[2,2':5',2''-terthiophene]-5,5''-diyl)carbonylhydrazocarbonyl[2,5-bis(octyloxy)-1,4-phenylene]carbonylhydrazocarbonyl] (9CI) (CA INDEX NAME)

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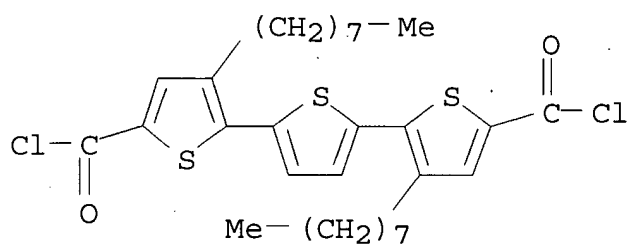
PAGE 1-B



RN 216773-04-5 ZCA
 CN 1,3-Benzenedicarboxylic acid, 2-methyl-, dihydrazide, polymer with
 3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-dicarbonyl dichloride
 (9CI) (CA INDEX NAME)

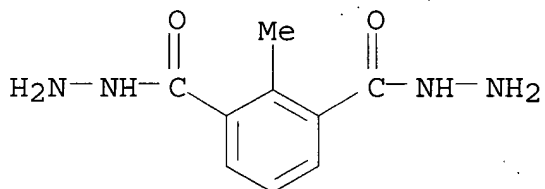
CM 1

CRN 215324-15-5
 CMF C30 H38 Cl2 O2 S3



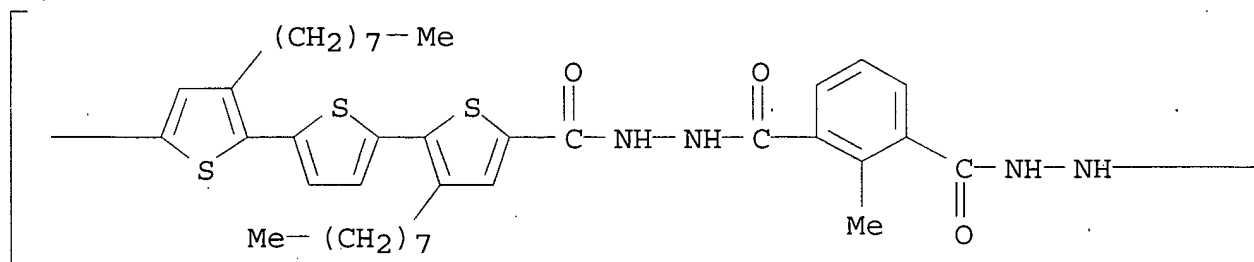
CM 2

CRN 210779-36-5
 CMF C9 H12 N4 O2



RN 216773-44-3 ZCA
 CN Poly[(3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-diyl)carbonylhazocarbonyl(2-methyl-1,3-phenylene)carbonylhazocarbonyl] (9CI) (CA INDEX NAME)

PAGE 1-A



$$\left[\begin{array}{c} \text{---C---} \\ || \\ \text{O} \end{array} \right]_n$$

- CC 36-5 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 35
IT 208445-55-0P, 3-Octylthiophene-2,5-dicarbonyl dichloride-terephthalic dihydrazide copolymer 208540-10-7P, 3-Octylthiophene-2,5-dicarbonyl dichloride-terephthalic dihydrazide copolymer, sru 210779-37-6P, 3,3'-Didecyl-2,2'-bithiophene-5,5'-dicarbonyl dichloride-2,6-toluenedicarbonyl dihydrazide copolymer 210779-38-7P, 3,3'-Didecyl-2,2'-bithiophene-5,2'-dicarbonyl chloride-2,6-toluenedicarbonyl dihydrazide copolymer, sru 215324-13-3P, 2,5-Di(octyloxy)terephthalic dihydrazide-3-octylthiophene-2,5-dicarbonyl dichloride copolymer 215324-14-4P, 3,3'-Didecyl-2,2'-bithiophene-5,5'-dicarbonyl dichloride-2,5-di(octyloxy)terephthalic dihydrazide copolymer **215324-16-6P**, 2,5-Dioctyloxyterephthalic dihydrazide-3,3''-dioctyl-2,2':5',2''-terthiophene-5,5''-dicarbonyl dichloride copolymer 215324-17-7P, 3,3'-Didecyl-2,2'-bithiophene-2,5'-dicarbonyl chloride-2,5-di(octyloxy)terephthalic dihydrazide copolymer, sru **215324-18-8P**, 2,5-Dioctyloxyterephthalic dihydrazide-3,3''-dioctyl-2,2':5',2''-terthiophene-5,5''-dicarbonyl dichloride copolymer, sru 215443-33-7P, 2,5-Di(octyloxy)terephthalic dihydrazide-3-octylthiophene-2,5-dicarbonyl dichloride copolymer, sru 216772-96-2P, 3-Octylthiophene-2,5-dicarbonyl dichloride-2,6-toluenedicarbonyl dihydrazide copolymer **216773-04-5P**, 3,3''-Dioctyl-2,2':5',2''-terthiophene-5,5''-dicarbonyl dichloride-2,6-toluenedicarbonyl hydrazide copolymer **216773-44-3P** 216973-16-9P, 3-Octylthiophene-2,5-dicarbonyl dichloride-2,6-toluenedicarbonyl dihydrazide copolymer, sru (tuning redox behavior and emissive wavelength of conjugated polymers by p-n diblock structures)
- L42 ANSWER 8 OF 14 ZCA COPYRIGHT 2003 ACS
129:343775 Synthesis of 1,4-bis(1,3,4-oxadiazol-2-yl)-2,5-dialkoxybenzene-oligothiophene copolymers with different emissive colors: synthetically tuning the photoluminescence of conjugated polymers. Yu, Wang-Lin; Meng, Hong; Pei, Jian; Chua, Soo-Jin; Huang, Wei; Lai, Yee-Hing (Institute of Materials Research and Engineering, National University of Singapore, Singapore, 119260, Singapore). Chemical Communications (Cambridge) (18), 1957-1958 (English) 1998. CODEN: CHCOFS. ISSN: 1359-7345.

Publisher: Royal Society of Chemistry.

AB A series of totally conjugated copolymers consisting of oligothiophenes and 1,4-bis(1,3,4-oxadiazol-2-yl)-2,5-dioctyloxybenzene were prepd. by polycondensation of 3-octyl-2,5-thiophenedicarbonyl dichloride monomer, dimer and trimer with 3,6-dioctyloxyterephthaloyl dihydrazide followed by conversion of the polyhydrazide products into polyoxadiazoles by refluxing in POCl₃. The emissive color of the copolymers could be tuned from blue to green to orange by increasing the no. of thiophene rings in the oligothiophene blocks from one to three. The 1,4-bis(1,3,4-oxadiazol-2-yl)-2,5-dioctyloxybenzene block acts as part of the whole conjugated structure and is equiv. to about two to three thiophene rings. These **electroluminescent** polymeric materials may provide an effective approach to the synthesis of n-doped type **electroluminescent** materials with different emissive colors due to the high electron affinity of 1,3,4-oxadiazole.

IT 215324-16-6P 215324-18-8P 215324-20-2P

(synthetically tuning photoluminescence of conjugated polymers in synthesis of 1,4-bis(1,3,4-oxadiazol-2-yl)-2,5-dialkoxybenzene-oligothiophene copolymers with different emissive colors)

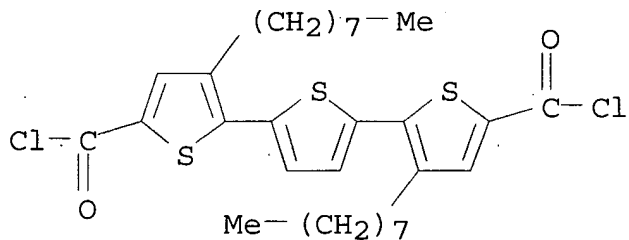
RN 215324-16-6 ZCA

CN 1,4-Benzenedicarboxylic acid, 2,5-bis(octyloxy)-, dihydrazide, polymer with 3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-dicarbonyl dichloride (9CI) (CA INDEX NAME)

CM 1

CRN 215324-15-5

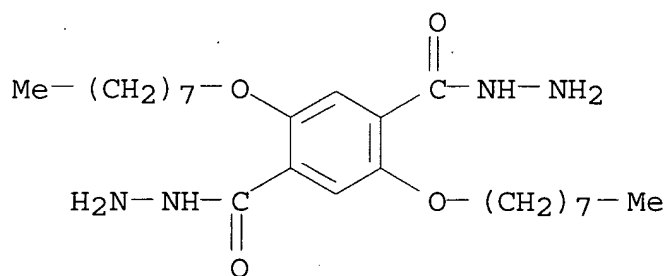
CMF C30 H38 Cl2 O2 S3



CM 2

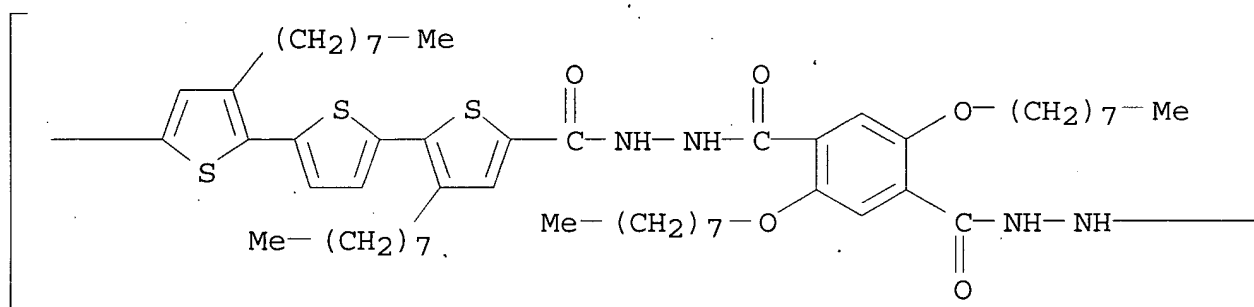
CRN 215324-12-2

CMF C24 H42 N4 O4

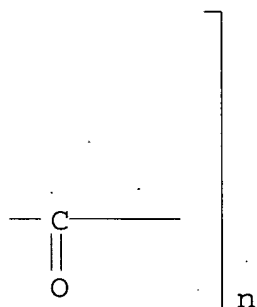


RN 215324-18-8 ZCA
 CN Poly[(3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-diyl)carbonylhydrazocarbonyl[2,5-bis(octyloxy)-1,4-phenylene]carbonylhydrazocarbonyl] (9CI) (CA INDEX NAME)

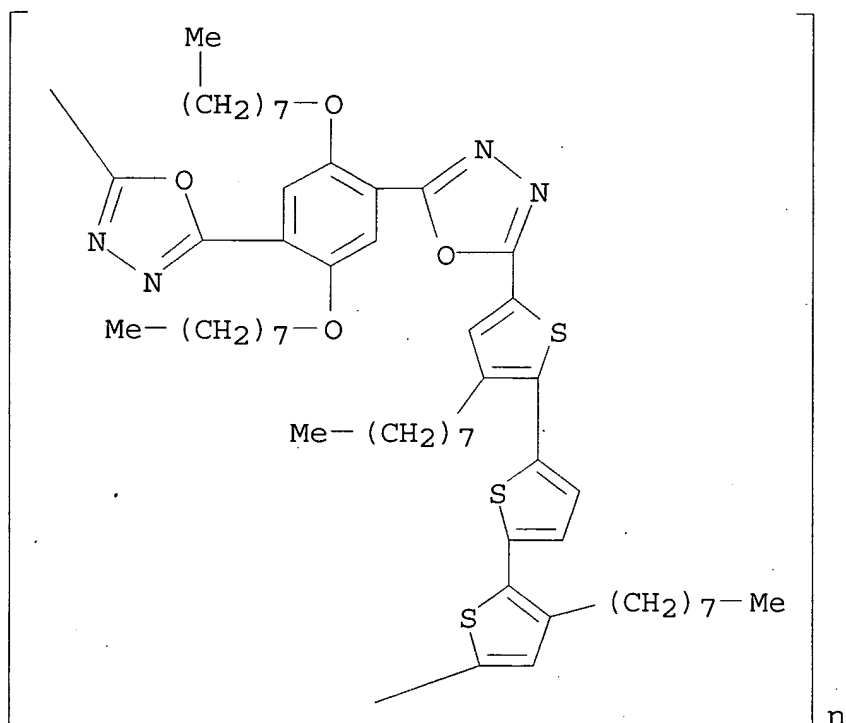
PAGE 1-A



PAGE 1-B



RN 215324-20-2 ZCA
 CN Poly[1,3,4-oxadiazole-2,5-diyl[2,5-bis(octyloxy)-1,4-phenylene]-1,3,4-oxadiazole-2,5-diyl(3,3''-dioctyl[2,2':5',2''-terthiophene]-5,5''-diyl)] (9CI) (CA INDEX NAME)



CC 35-5 (Chemistry of Synthetic High Polymers)
 ST **electroluminescent** polythiophene polyoxadiazole;
 luminescence conjugated polythiophene polyoxadiazole
 IT 215324-13-3P 215324-14-4P **215324-16-6P** 215324-17-7P
215324-18-8P 215324-19-9P **215324-20-2P**
 215443-33-7P 215443-40-6P

(synthetically tuning photoluminescence of conjugated polymers in synthesis of 1,4-bis(1,3,4-oxadiazol-2-yl)-2,5-dialkoxybenzene-oligothiophene copolymers with different emissive colors)

L42 ANSWER 9 OF 14 ZCA COPYRIGHT 2003 ACS

129:337354 **Light emission** from

electroluminescent Langmuir-Blodgett films of a polyester derived from oligothiophene. Goldenberg, L. M.; Leclerc, M.; Donat-Boüillud, A.; Pearson, C.; Petty, M. C. (Institute of Chemical Physics in Chernogolovka, Russian Academy of Science, Chernogolovka, 142432, Russia). Thin Solid Films, 327-329, 715-717 (English) 1998. CODEN: THSFAP. ISSN: 0040-6090. Publisher: Elsevier Science S.A..

AB **Electroluminescent** devices using Z-type Langmuir-Blodgett multilayer films of poly(hexaethyleneglycol-3'',4''-dihexyl-2,2';5'',2'';5''',2'''';5''',2''''-pentathiophene-5,5''''-dicarboxylate) (PPOE6) as the active region were fabricated. The org. material was incorporated in a sandwich structure between In Sn oxide (ITO) and Al electrodes. Diode-like characteristics were obsd., with a power law relation between current and voltage indicative of charge injection at the contacts. Probably the

recombination of electrons and holes (injected at the Al and ITO contacts, resp.) was responsible for the **electroluminescent** effect. The threshold voltage for the generation of yellow light (visible in a darkened room) was .apprx.4 V Using a calibrated photodiode to measure the optical output power, a quantum efficiency of the order of 1 .times. 10-2% was calcd.

IT 196800-70-1 196800-72-3

(light emission from

electroluminescent Langmuir-Blodgett films of polyester derived from oligothiophene)

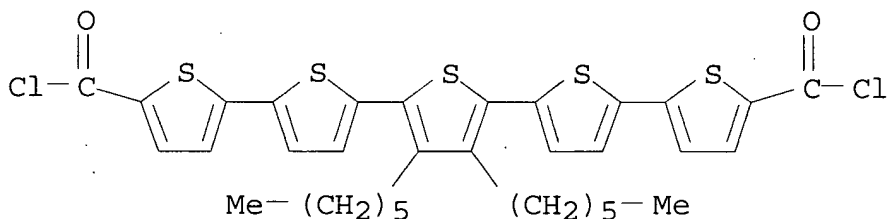
RN 196800-70-1 ZCA

CN [2,2':5',2'':5'',2''':5''',2''''-Quinquethiophene]-5,5''''-dicarbonyl dichloride, 3'',4''-dihexyl-, polymer with 3,6,9,12,15-pentaoxaheptadecane-1,17-diol (9CI) (CA INDEX NAME)

CM 1

CRN 189190-14-5

CMF C34 H34 Cl2 O2 S5

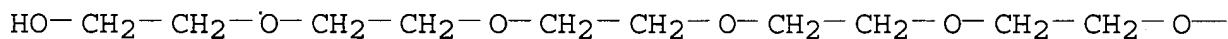


CM 2

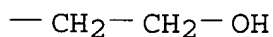
CRN 2615-15-8

CMF C12 H26 O7

PAGE 1-A



PAGE 1-B



RN 196800-72-3 ZCA

CN Poly[(3'',4''-dihexyl[2,2':5',2'':5'',2''':5''',2''''-quinquethiophene]-5,5''''-diyl)carbonyloxy-1,2-ethanediylloxy-1,2-ethanediylloxy-1,2-ethanediylloxy-1,2-ethanediylloxy-1,2-ethanediylloxycarbonyl] (9CI) (CA INDEX NAME)

Electroactive and Photoactive Polyesters Derived from Oligothiophenes. Donat-Bouillud, Anne; Mazerolle, Louise; Gagnon, Paul; Goldenberg, Leonid; Petty, Michael C.; Leclerc, Mario (Departement de Chimie, Universite de Montreal, Montreal, QC, H3C 3J7, Can.). Chemistry of Materials, 9(12), 2815-2821 (English) 1997. CODEN: CMATEX. ISSN: 0897-4756. Publisher: American Chemical Society.

AB Incorporation of oligothiophene (d.p. 2-5) moieties into polyester structures permitted the prepn. of tunable electroactive and/or photoactive processable materials with good mech. properties. Polyesters with bithiophene or terthiophene units show interesting emissive properties in the blue range whereas, in addn. to interesting photophys. properties, polymers with quaterthiophene moieties exhibit a reversible redox process which leads to the formation of radical cations. These results clearly indicate for the first time that both p-type and n-type charge transport hopping (possibly through oligothiophene B-stacks) can also lead to interesting elec. cond. levels. Polyesters contg. quaterthiophene or pentathiophene units show some electroactivity affording the formation of radical cations and dimerized radical cations, while pentathiophene units even permit the formation of neg. charge carriers. The presence of these charge carriers increases dramatically the cond. to values up to 0.4 S/cm in both oxidized and reduced states. This good elec. transport of both p-type and n-type charge carriers combined with luminescent properties and Langmuir-Blodgett processability could lead to well-organized and efficient **light-emitting** devices.

IT 189190-01-0P 189190-04-3P 189190-08-7P
189190-11-2P 189190-15-6P 189190-17-8P
196800-62-1P 196800-63-2P 196800-64-3P
196800-65-4P 196800-66-5P 196800-67-6P
196800-70-1P 196800-72-3P

(prepn., photochromism, elec. cond., and Langmuir-Blodgett processability of oligothiophene-contg. polyesters)

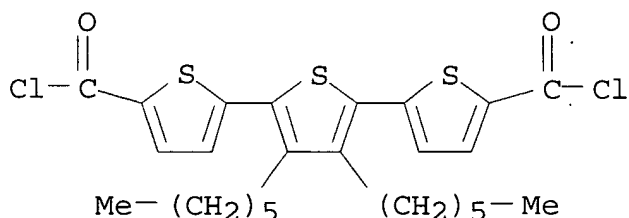
RN 189190-01-0 ZCA

CN [2,2':5',2''-Terthiophene]-5,5''-dicarbonyl dichloride, 3',4'-dihexyl-, polymer with 1,10-decanediol (9CI) (CA INDEX NAME)

CM 1

CRN 170660-73-8

CMF C26 H30 Cl2 O2 S3

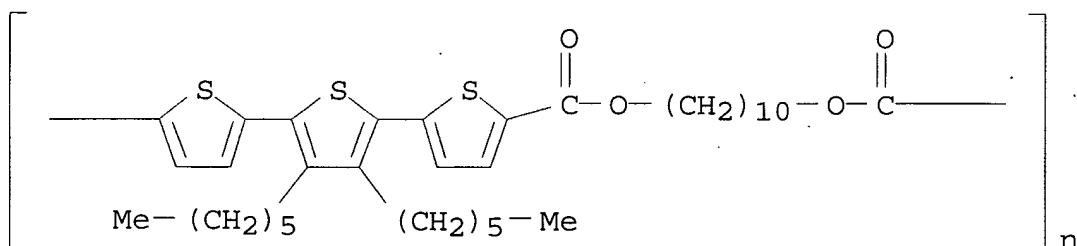


CM 2

CRN 112-47-0
CMF C10 H22 O2

HO-(CH₂)₁₀-OH

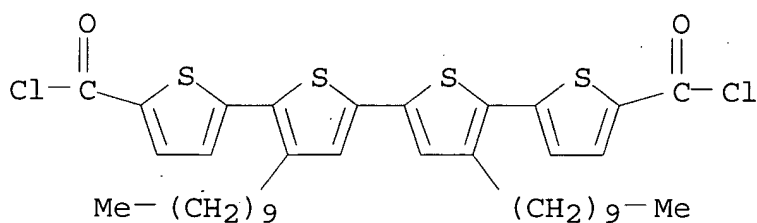
RN 189190-04-3 ZCA
CN Poly[(3',4'-dihexyl[2,2':5',2''-terthiophene]-5,5''-diyl)carbonyloxy-1,10-decanediylcarbonyl] (9CI) (CA INDEX NAME)



RN 189190-08-7 ZCA
CN [2,2':5',2'':5'',2'''-Quaterthiophene]-5,5'''-dicarbonyl dichloride, 3',4''-didecyl-, polymer with 1,10-decanediol (9CI) (CA INDEX NAME)

CM 1

CRN 189190-07-6
CMF C38 H48 Cl2 O2 S4



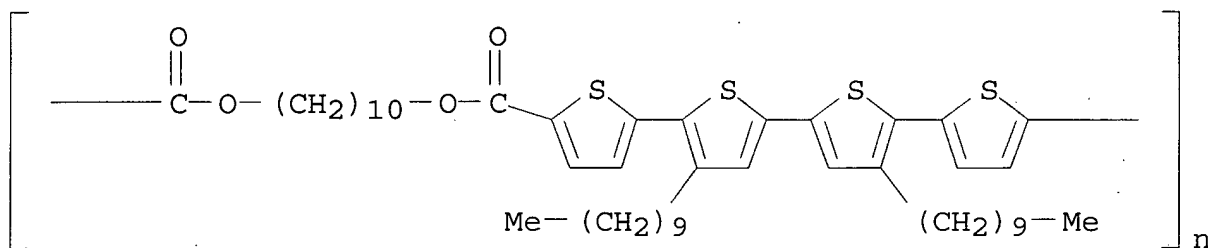
CM 2

CRN 112-47-0
CMF C10 H22 O2

HO-(CH₂)₁₀-OH

RN 189190-11-2 ZCA
CN Poly[(3',4''-didecyl[2,2':5',2'':5'',2'''-quaterthiophene]-5,5'''-

diyl)carbonyloxy-1,10-decanediylloxycarbonyl] (9CI) (CA INDEX NAME)



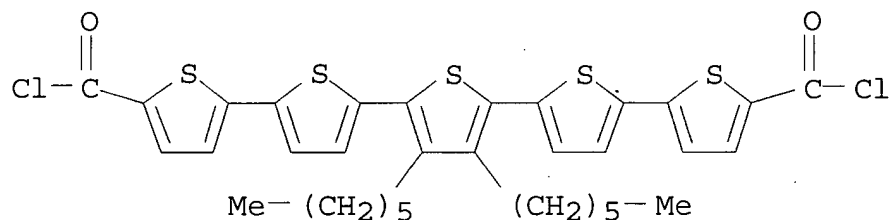
RN 189190-15-6 ZCA

CN [2,2':5',2'':5'',2''':5''',2''':5''''-Quinquethiophene]-5,5''''-dicarbonyl dichloride, 3'',4''-dihexyl-, polymer with 1,10-decanediol (9CI) (CA INDEX NAME)

CM 1

CRN 189190-14-5

CMF C34 H34 Cl2 O2 S5



CM 2

CRN 112-47-0

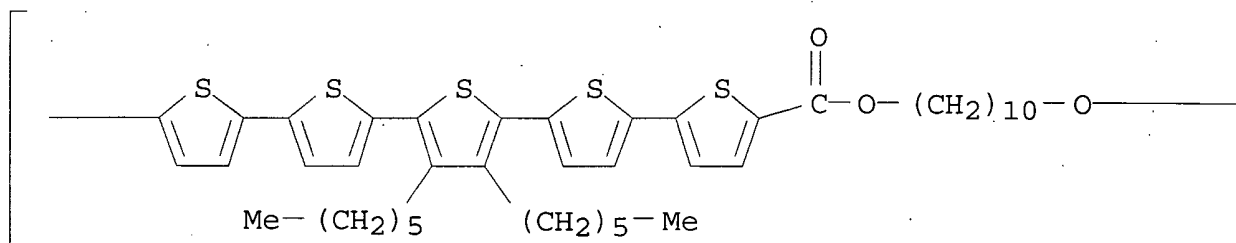
CMF C10 H22 O2

HO-(CH₂)₁₀-OH

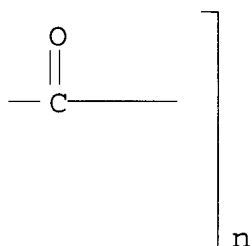
RN 189190-17-8 ZCA

CN Poly[(3'',4''-dihexyl[2,2':5',2'':5'',2''':5''',2''':5''''-quinquethiophene]-5,5''''-diyl)carbonyloxy-1,10-decanediylloxycarbonyl] (9CI) (CA INDEX NAME)

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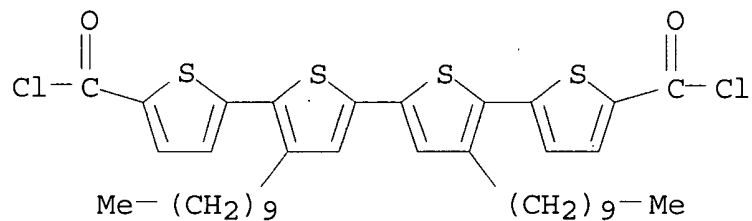
PAGE 1-B



RN 196800-62-1 ZCA
 CN [2,2':5',2'':5'',2''':5'''-Quaterthiophene]-5,5'''-dicarbonyl dichloride,
 3',4'''-didecyl-, polymer with 1,6-hexanediol (9CI) (CA INDEX NAME)

CM 1

CRN 189190-07-6
 CMF C38 H48 Cl2 O2 S4

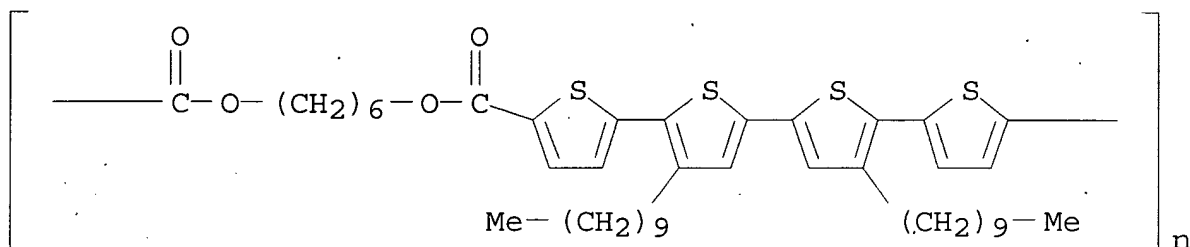


CM 2

CRN 629-11-8
 CMF C6 H14 O2

HO-(CH2)6-OH

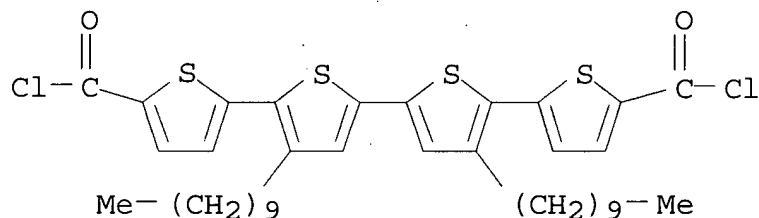
RN 196800-63-2 ZCA
 CN Poly[(3',4''-didecyl[2,2':5',2'':5'',2'''-quaterthiophene]-5,5'''-diyl)carbonyloxy-1,6-hexanediylloxycarbonyl] (9CI) (CA INDEX NAME)



RN 196800-64-3 ZCA
 CN [2,2':5',2'':5'',2'''-Quaterthiophene]-5,5'''-dicarbonyl dichloride, 3',4''-didecyl-, polymer with 3,6,9,12,15-pentaoxaheptadecane-1,17-diol (9CI) (CA INDEX NAME)

CM 1

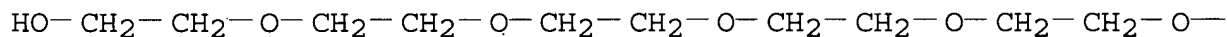
CRN 189190-07-6
 CMF C38 H48 Cl2 O2 S4



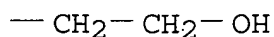
CM 2

CRN 2615-15-8
 CMF C12 H26 O7

PAGE 1-A

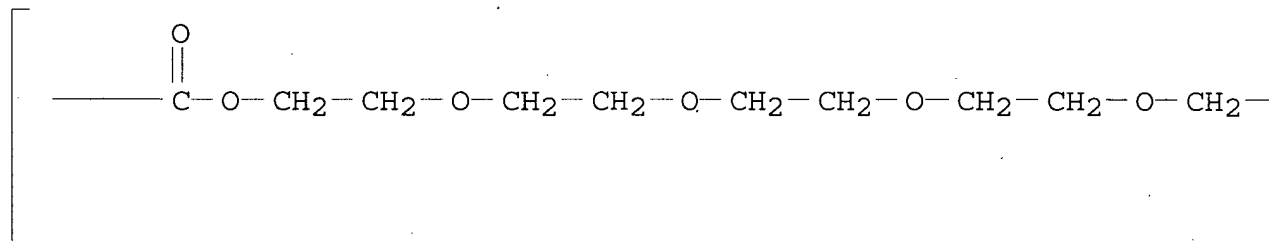


PAGE 1-B

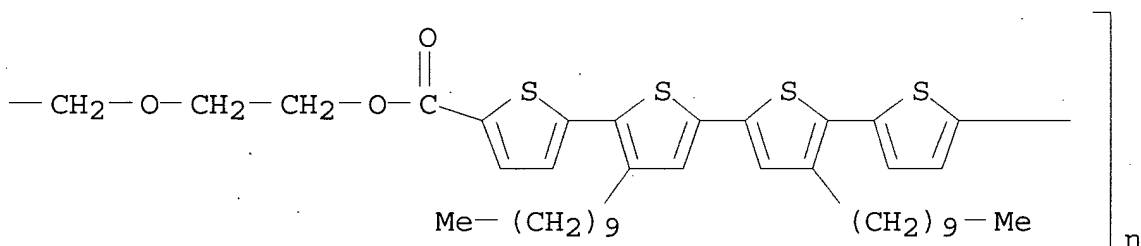


[illegible]

PAGE 1-A



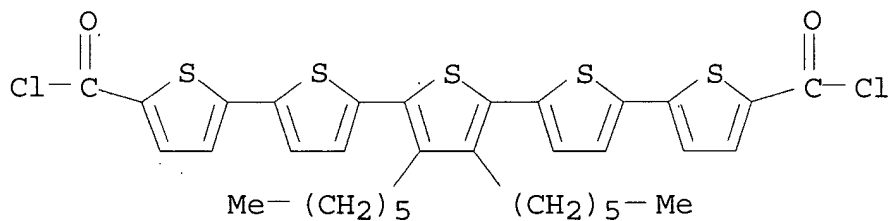
PAGE 1-B



RN	196800-66-5	ZCA
CN	[2,2':5',2'':5'',2''':5''',2''''-Quinquethiophene]-5,5''''-dicarbonyl dichloride, 3'',4''-dihexyl-, polymer with 1,6-hexanediol (9CI) (CA INDEX NAME)	

CM 1

CRN 189190-14-5
CMF C34 H34 Cl2 O2 S5



CM 2

CRN 629-11-8

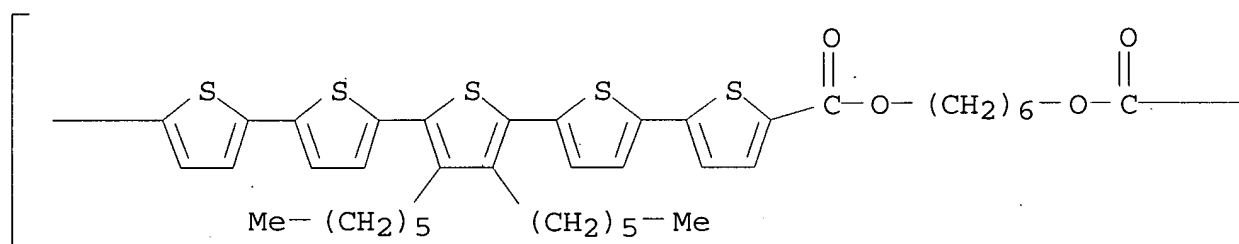
CMF C6 H14 O2

HO-(CH₂)₆-OH

RN 196800-67-6 ZCA

CN Poly[(3'',4''-dihexyl[2,2':5',2'':5'',2''':5''',2''':5''''-
quinguethiophene]-5,5''''-diyl)carbonyloxy-1,6-
hexanediylloxycarbonyl] (9CI) (CA INDEX NAME)

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PAGE 1-B



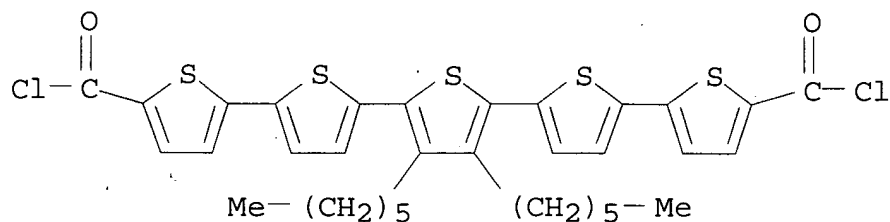
RN 196800-70-1 ZCA

CN [2,2':5',2'':5'',2''':5''',2''':5''''-Quinguethiophene]-5,5''''-
dicarbonyl dichloride, 3'',4''-dihexyl-, polymer with
3,6,9,12,15-pentaoxaheptadecane-1,17-diol (9CI) (CA INDEX NAME)

CM 1

CRN 189190-14-5

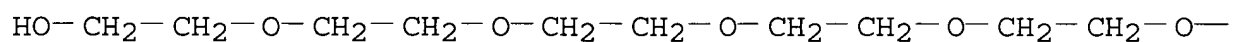
CMF C34 H34 Cl2 O2 S5



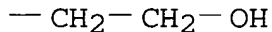
CM 2

CRN 2615-15-8
CMF C12 H26 O7

PAGE 1-A

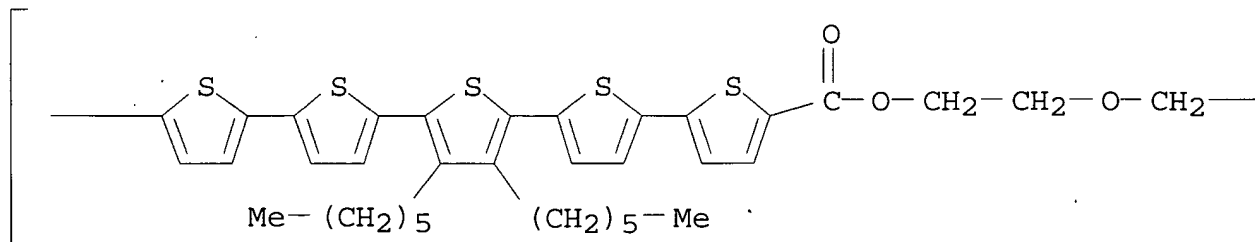


PAGE 1-B



RN 196800-72-3 ZCA
CN Poly[(3'',4''-dihexyl[2,2':5',2'':5'',2''':5''',2''''-
quinguethiophene]-5,5''''-diyl)carbonyloxy-1,2-ethanediylloxy-1,2-
ethanediylloxy-1,2-ethanediylloxy-1,2-ethanediylloxy-1,2-ethanediylloxy-
1,2-ethanediylloxycarbonyl] (9CI) (CA INDEX NAME)

PAGE 1-A



$$\text{---CH}_2\text{---O---CH}_2\text{---CH}_2\text{---O---CH}_2\text{---CH}_2\text{---O---CH}_2\text{---CH}_2\text{---O---CH}_2\text{---CH}_2\text{---O---C}\overset{\text{O}}{\parallel}\text{---}$$

PAGE 1-C

n

IT 189189-97-7P 189190-01-0P 189190-04-3P
189190-08-7P 189190-11-2P 189190-15-6P
189190-17-8P 189190-20-3P 196800-62-1P
196800-63-2P 196800-64-3P 196800-65-4P
196800-66-5P 196800-67-6P 196800-70-1P
196800-72-3P

L42 ANSWER 11 OF 14 ZCA COPYRIGHT 2003 ACS .

123:315123. Spectroscopy and Photophysics of Some Oligomers and Polymers
Derived from Thiophenes. Belletete, Michel; Mazerolle, Louise;
Desrosiers, Natalie; Leclerc, Mario; Durocher, Gilles (Departement
de Chimie, Universite de Montreal, Montreal, QC, H3C3J7, Can.).
Macromolecules, 28(25), 8587-97 (English) 1995. CODEN:
MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB A series of bithiophene and terthiophene derivs. and their resp. polymers have been prepd. The absorption and fluorescence spectra, quantum yields, and lifetimes of these derivs. in soln. are studied and compared. The bandwidths of the absorption and fluorescence profiles of the different derivs. are used to discuss the geometry changes occurring from one mol. to the other in the ground and excited states. Increasing the chain length and/or substitution of bithiophene and terthiophene at both ends of the mol. with a carbonyl chloride group increases the planarity of the mols. in both their ground and excited states by improving the electronic delocalization throughout the mol. frame. Comparison between the absorption and fluorescence spectra has proved to be a good tool to

discover conformational changes occurring during the relaxation of the excited state. All the mols. investigated show geometrical changes from a twisted ground state to a more planar conformation in the excited state. A radiationless torsional mechanism and intersystem crossing processes are involved in the excited state relaxation of the various mols. Incorporation of substituted bithiophene and terthiophene units in arom. polyesters have been made and the optical and photophys. properties of these polymers are studied. It is shown that the bithiophene and terthiophene units are perfectly isolated in the polymeric chain. The photophys. properties of the polyesters make these materials good candidates for the fabrication of efficient blue-light-emitting diodes.

IT 151486-98-5 170660-79-4

(spectroscopy and photophysics of some oligomers and polymers derived from thiophenes)

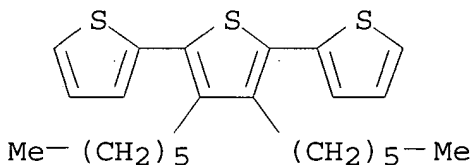
RN 151486-98-5 ZCA

CN 2,2':5',2''-Terthiophene, 3',4'-dihexyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

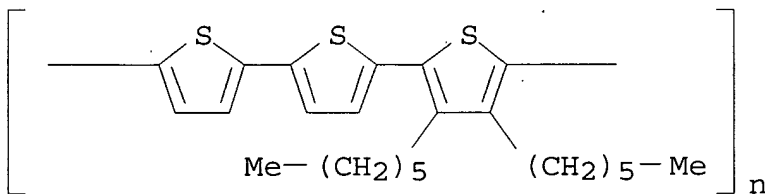
CRN 151324-66-2

CMF C24 H32 S3



RN 170660-79-4 ZCA

CN Poly(3,4-dihexyl[2,2':5',2''-terthiophene]-5,5''-diyl) (9CI) (CA INDEX NAME)



IT 170660-76-1P 170660-77-2P

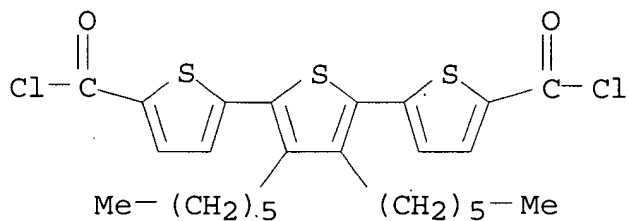
(spectroscopy and photophysics of some oligomers and polymers derived from thiophenes)

RN 170660-76-1 ZCA

CN [2,2':5',2''-Terthiophene]-5,5''-dicarbonyl dichloride, 3',4'-dihexyl-, polymer with 1,4-benzenediol (9CI) (CA INDEX NAME)

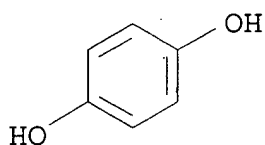
CM 1

CRN 170660-73-8
 CMF C26 H30 Cl2 O2 S3

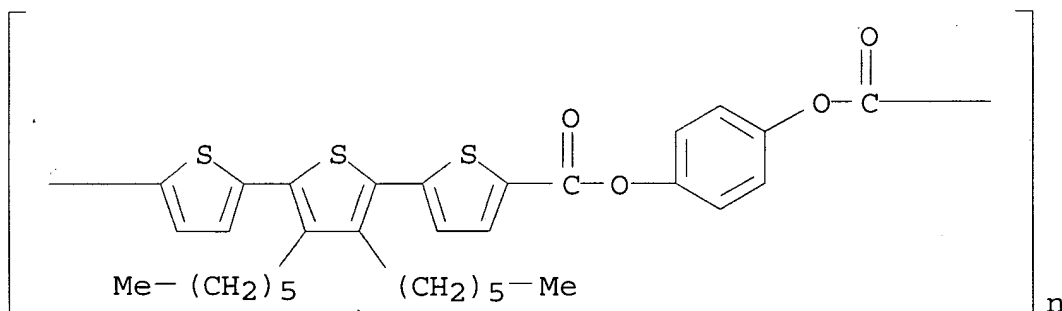


CM 2

CRN 123-31-9
 CMF C6 H6 O2



RN 170660-77-2 ZCA
 CN Poly[(3',4'-dihexyl[2,2':5',2''-terthiophene]-5,5''-diyl)carbonyloxy-1,4-phenyleneoxycarbonyl] (9CI) (CA INDEX NAME)



CC 36-5 (Physical Properties of Synthetic High Polymers)
 Section cross-reference(s): 35, 73
 IT 135756-86-4, 4,4'-Didecyl-2,2'-bithiophene homopolymer 151324-65-1
 151486-98-5 170660-78-3 170660-79-4
 (spectroscopy and photophysics of some oligomers and polymers
 derived from thiophenes)
 IT 170660-74-9P 170660-75-0P 170660-76-1P
 170660-77-2P
 (spectroscopy and photophysics of some oligomers and polymers
 derived from thiophenes)

L42 ANSWER 12 OF 14 ZCA COPYRIGHT 2003 ACS

122:226381 Polymer based tunable **light emitting** diode. Gill, Richard; Hadziioannou, Georges; Wildeman, Jurgen; Malliaris, George (Rijksuniversiteit te Groningen, Neth.). Eur. Pat. Appl. EP 633614 11 19950111, 9 pp. DESIGNATED STATES: R: AT, BE, DE, DK, ES, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE. (English) CODEN: EPXXDW. APPLICATION: EP 1993-202032 19930708.

AB **Light-emitting diode** **light emitting** **light** having a wavelength from 400 to 850 nm comprising a layer of an **electroluminescing** material, electrodes and optionally carrier material and/or reflecting material are described in which the **electroluminescing** mater. comprises at least one polymer in which the π -conjugation of the polymer backbone is distorted by the interaction of substituents on the backbone.

IT **161981-86-8P**
(polymer-based tunable **light emitting** diodes)

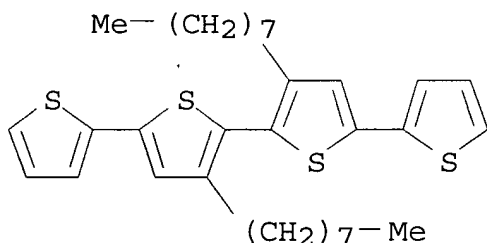
RN 161981-86-8 ZCA

CN 2,2':5',2'':5'',2'''-Quaterthiophene, 3'',4'-dioctyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 161981-85-7

CMF C32 H42 S4



IC ICM H01L033-00

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

Section cross-reference(s): 76

ST polymer tunable **light emitting** diode.

IT **Electroluminescent** devices
(polymer-based tunable **light emitting** diodes)

IT 104934-51-2P, 3-Octylthiophene homopolymer 161432-92-4P
161746-08-3P **161981-86-8P**

(polymer-based tunable **light emitting** diodes)

IT 3141-27-3 138058-53-4 145543-83-5 161981-87-9
(polymer-based tunable **light emitting** diodes)

L42 ANSWER 13 OF 14 ZCA COPYRIGHT 2003 ACS

122:92443 Multi-block copolymer based tunable **light**

emitting diode, polymers suitable therefor and oligomers. Hadziioannou, Georges; Herrema, Jan; Wildeman, Jurgen; Gill, Richard; Wieringa, Reini; Malliaris, George (Rijksuniversiteit te Groningen, Neth.). PCT Int. Appl. WO 9415368 A1 **19940707**, 32 pp. DESIGNATED STATES: W: AT, AU, BB, BG, BR, BY, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, KZ, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, US, VN; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1993-NL280.19931229. PRIORITY: EP 1992-204100 19921229; EP 1993-201637 19930608.

AB **Light-emitting** diodes (LED) **emitting** light having a wavelength from 400 to 850 which comprise an **electroluminescent** material, electrodes, and optionally carrier material and/or reflecting material, are described which employ an **electroluminescent** material comprising at least one block copolymer consisting of at least two types of blocks, active blocks sandwiched between non-active blocks, the active blocks being a .pi.-conjugated block of at least 2 and at most 16 monomeric units, the .pi.-conjugated block having a substantially uniform block length throughout the copolymer, and the non-active block having no .pi.-conjugation, optionally with addnl. electron and/or hole transport properties. Polymers suitable for prepg. the LEDs, oligomers for prepg. the multiblock copolymers, and processes for forming the oligomers and the polymers are also described.

IT **160581-45-3P 160581-46-4P**
(multiblock copolymer-based tunable **light emitting** diodes and polymers and oligomers for use in the diodes or their formation)

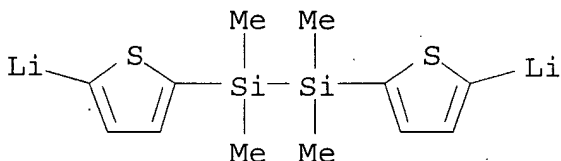
RN 160581-45-3 ZCA

CN Lithium, [μ -(1,1,2,2-tetramethyl-1,2-disilanediyldi-5,2-thiophenediyl)]di-, polymer with 5,5'''-dibromo-3,3'''-dioctyl-2,2':5',2'':5'',2'''-quaterthiophene (9CI) (CA INDEX NAME)

CM 1

CRN 160581-44-2

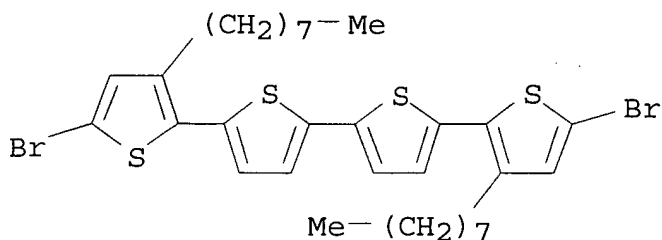
CMF C12 H16 Li2 S2 Si2



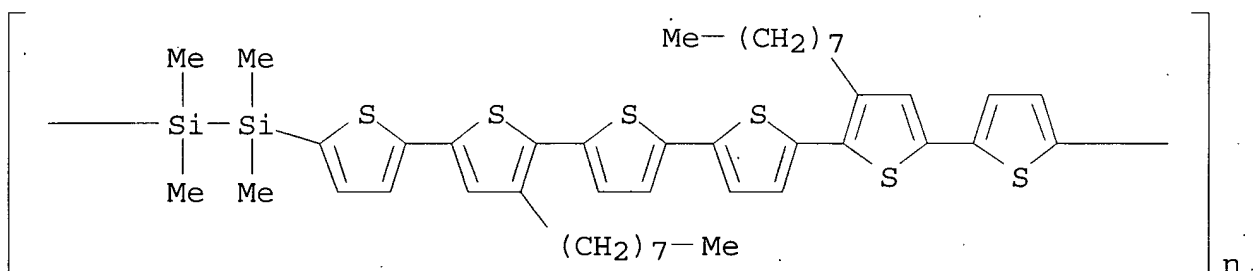
CM 2

CRN 153938-77-3

CMF C32 H40 Br2 S4



RN 160581-46-4 ZCA
CN Poly[(3''',4'-dioctyl[2,2':5',2'':5'',2'''':5''',2''':5''''',2''''':5''''',2''''':5''''']sexithiophene)-5,5''''''-diyl](1,1,2,2-tetramethyl-1,2-disilanediy)]
(9CI) (CA INDEX NAME)



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IC      ICM      H01L033-00
ICS     H05B033-14; C09K011-06; C08G077-60
CC      73-5 (Optical, Electron, and Mass Spectroscopy and Other Related
        Properties)
ST      block copolymer light emitting diode;
        electroluminescent device block copolymer
IT      Electroluminescent devices
        (multiblock copolymer-based tunable light
        emitting diodes and polymers and oligomers for use in the
        diodes or their formation)
IT      160581-42-0P      160581-43-1P 160581-45-3P
        160581-46-4P
        (multiblock copolymer-based tunable light
        emitting diodes and polymers and oligomers for use in the
        diodes or their formation)
IT      4805-22-5      153938-80-8, 2-Iodo-3-octylthiophene
        (multiblock copolymer-based tunable light
        emitting diodes and polymers and oligomers for use in the
        diodes or their formation)
IT      153938-82-0P
        (multiblock copolymer-based tunable light
        emitting diodes and polymers and oligomers for use in the
        diodes or their formation)
IT      153938-77-3P
        (multiblock copolymer-based tunable light
        emitting diodes and polymers and oligomers for use in the

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diodes or their formation)

L42 ANSWER 14 OF 14 ZCA COPYRIGHT 2003 ACS

120:333988 Tuning of the photo- and **electroluminescence** in multi-block copolymers of poly[(silanylene)thiophenes] via exciton confinement. Malliaras, George G.; Herrema, Jan K.; Wildeman, Jurjen; Wieringa, Rienier H.; Gill, Richard E.; Lampoura, Stephanina S.; Hadziioannou, Georges (Mater. Sci. Cent., Univ. Groningen, Groningen, 9747 AG, Neth.). Advanced Materials (Weinheim, Germany), 5(10), 721-3 (English) 1993. CODEN: ADVMEW. ISSN: 0935-9648.

AB Poly[(silanylene)-thiophene] block copolymers used in **electroluminescent** devices with a range of colors from blue to orange-red are presented. By casting the polymes from soln., large active areas can be envisioned in the near future. Further research is in progress to optimize device parameters.

IT 155648-14-9 155648-15-0
(tuning of **electroluminescence** and
electroluminescence in, via exciton confinement)

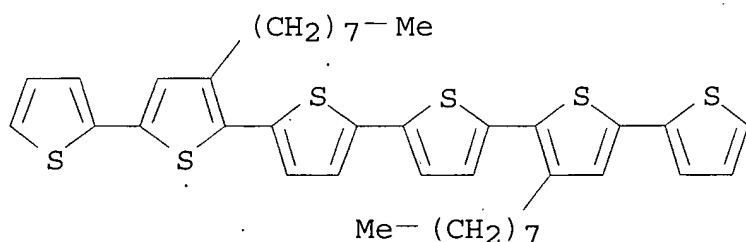
RN 155648-14-9 ZCA

CN Silane, dibutyldichloro-, polymer with 4',4''''-dioctyl-2,2':5',2'':5'',2''':5''',2''':5''',2''':5'''-sexithiophene, block (9CI) (CA INDEX NAME)

CM 1

CRN 155648-13-8

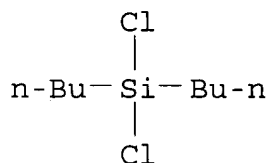
CMF C40 H46 S6



CM 2

CRN 3449-28-3

CMF C8 H18 Cl2 Si



=> d l15 1-51 cbib abs hitstr hitrn

L15 ANSWER 1 OF 51 ZCA COPYRIGHT 2003 ACS

138:221998 Poly(heteroaromatic) block copolymers with electrical conductivity. Luebben Devito, Sylvia; Elliott, Brian; Wilson, Carolina (TDA Research, Inc., USA). PCT Int. Appl. WO 2003018648 A1 20030306, 55 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (English). CODEN: PIXXD2. APPLICATION: WO 2002-US28064 20020903. PRIORITY: US 2001-PV316607 20010831.

AB The block copolymers contain .gtoreq.1 block of a poly(heteroarom.) polymer and .gtoreq.2 blocks of a nonconjugated polymer, alternately the poly(heteroarom.) block may contain latent polymerizable groups forming crosslinked networks. The chem. different blocks of the copolymer are covalently bonded to each other in an alternating fashion through an appropriate linkage group. The poly(heteroarom.) block may exist in its neutral or oxidized form, and when in the oxidized form, it assoc. with org. or inorg. counteranions to balance the charge. The poly(heteroarom.) polymer is an intrinsically conducting polymer (IPC), and when in the oxidized form it is elec. conducting. When the IPC block or blocks of the block copolymer are in the doped form, the block copolymer is elec. conducting. Preferably the conducting block copolymers have conductivities 10⁻⁶-10³ S/cm. Block copolymers are sol. or dispersible in H₂O, .gtoreq.1 org. solvents, or in a mixt. at a level of .gtorsim.0.1 g/L.

IT 500734-78-1P

(triblock, UV-crosslinked; Poly(heteroarom.) block copolymers in oxidized form with high elec. cond.)

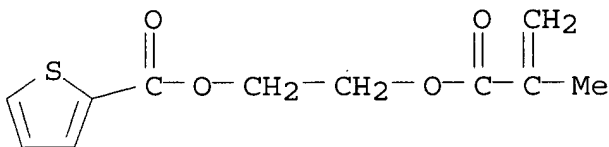
RN 500734-78-1 ZCA

CN 2-Thiophenecarboxylic acid, 2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl ester, polymer with 3-hexylthiophene, block (9CI) (CA INDEX NAME)

CM 1

CRN 500734-72-5

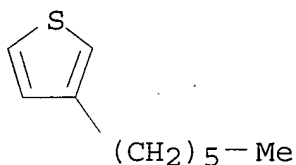
CMF C11 H12 O4 S



CM 2

CRN 1693-86-3

CMF C10 H16 S



IT 500734-79-2P

(triblock; Poly(heteroarom.) block copolymers in oxidized form with high elec. cond.)

RN 500734-79-2 ZCA

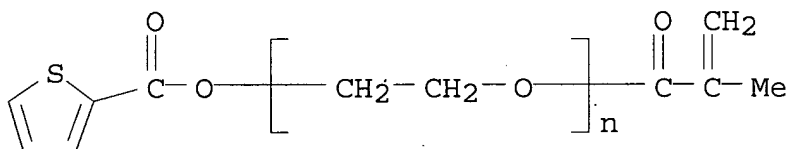
CN Thiophene, 3-hexyl-, polymer with .alpha.-(2-methyl-1-oxo-2-propenyl)-.omega.-[(2-thienylcarbonyl)oxy]poly(oxy-1,2-ethanediyl), block (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

CM 1

CRN 500734-76-9

CMF (C2 H4 O)_n C9 H8 O3 S

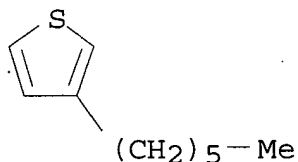
CCI PMS



CM 2

CRN 1693-86-3

CMF C10 H16 S



IT 500734-78-1P

(triblock, UV-crosslinked; Poly(heteroarom.) block copolymers in oxidized form with high elec. cond.)

IT 500734-79-2P

(triblock; Poly(heteroarom.) block copolymers in oxidized form with high elec. cond.)

L15 ANSWER 2 OF 51 ZCA COPYRIGHT 2003 ACS

136:279787 Synthesis, blending, and doping of electrically conducting poly(3-undecylbithiophene) in supercritical carbon dioxide. Webb, Kimberly Faye (Georgia Institute of Technology, Atlanta, GA, USA). 196 pp. Avail. UMI, Order No. DA3004591 From: Diss. Abstr. Int., B 2001, 62(2), 967 (English) 2001.

AB Unavailable

IT 168908-28-9P

(synthesis, blending, and doping of elec. conducting poly(3-undecylbithiophene) in supercrit. carbon dioxide)

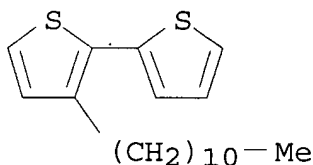
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



IT 168908-28-9P

(synthesis, blending, and doping of elec. conducting poly(3-undecylbithiophene) in supercrit. carbon dioxide)

L15 ANSWER 3 OF 51 ZCA COPYRIGHT 2003 ACS

136:271180 Stability of poly(3-alkylthiophene) doped with copper(II) perchlorate. Masuda, Hideyuki (Mol. Eng. Div., Kanagawa Ind. Technol. Res. Inst., Ebina, 243-0435, Japan). Kenkyu Hokoku - Kanagawa-ken Sangyo Gijutsu Sogo Kenkyusho, 7, 63-66 (Japanese) 2001. CODEN: KGSKF7. ISSN: 1341-6529. Publisher: Kanagawa-ken Sangyo Gijutsu Sogo Kenkyusho.

AB Poly(3-dodecyl-2,2'-bithiophene) (PDBT) and poly(3-dodecylthiophene) (PDP) were chem. prepd. and doped with Cu(II) perchlorate. The cond., stability of various solvent/oxidant combinations and spectral changes in the doped polymers kept in air were compared. The salts of Cu(II) ions were effective oxidants for chem. polymn. The combination of Cu(II) perchlorate and CH₂Cl₂ contributed well to stability in the doped states. These results suggest that PDBT doped with Cu(II) perchlorate is stable in the doped state in CH₂Cl₂.

IT 119889-86-0P, Poly(3-dodecyl-2,2'-bithiophene)

(stability and cond. of poly(3-alkylthiophene) doped with copper(II) perchlorate)

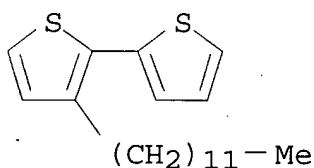
RN 119889-86-0 ZCA

CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9

CMF C20 H30 S2



IT 119889-86-0P, Poly(3-dodecyl-2,2'-bithiophene)
(stability and cond. of poly(3-alkylthiophene) doped with
copper(II) perchlorate)

L15 ANSWER 4 OF 51 ZCA COPYRIGHT 2003 ACS

136:152233 Oxidative doping and characterization of electrically
conductive poly(undecyl bithiophene)s with quinone based oxidants.
Brooms, Christine Edmond (Georgia Institute of Technology, Atlanta,
GA, USA). 119 pp. Avail. UMI, Order No. DA3004600 From: Diss.
Abstr. Int., B 2001, 62(2), 878 (English) 2001.

AB Unavailable

IT 168908-28-9, 3-Undecyl-2,2'-bithiophene homopolymer
(oxidative doping and characterization of elec. conductive
poly(undecyl bithiophene)s with quinone based oxidants)

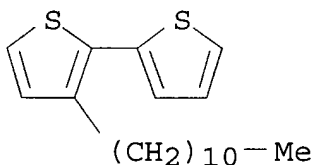
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



IT 168908-28-9, 3-Undecyl-2,2'-bithiophene homopolymer
(oxidative doping and characterization of elec. conductive
poly(undecyl bithiophene)s with quinone based oxidants)

L15 ANSWER 5 OF 51 ZCA COPYRIGHT 2003 ACS

136:6729 Synthesis and characterisation of novel regioregular
polythiophenes - tuning the redox properties. Greve, Daniel R.;
Apperloo, Joke J.; Janssen, Rene A. J. (Laboratory of Macromolecular
and Organic Chemistry, Eindhoven University of Technology,

Eindhoven, 5600 MB, Neth.). European Journal of Organic Chemistry (18), 3437-3443 (English) 2001. CODEN: EJOCFK. ISSN: 1434-193X. Publisher: Wiley-VCH Verlag GmbH.

AB The synthesis and full characterization of three novel regioregular polythiophenes 8, 9, and 15 is presented. By varying the nature of the substituents on the polythiophene backbone in these materials it is possible to increase their first oxidn. potential by almost 0.5 V. Because the first redn. potential follows the same trend, the electrochem. band gap of these polymers is essentially const. The const. band gap inferred from the electrochem. data is confirmed by the onset of the optical absorption spectrum of the polythiophenes, which shows only small changes.

IT 350499-04-6P 350499-05-7P
(synthesis of regioregular polythiophenes)

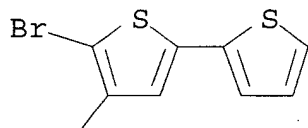
RN 350499-04-6 ZCA

CN 2,2'-Bithiophene, 5-bromo-4-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 350499-03-5

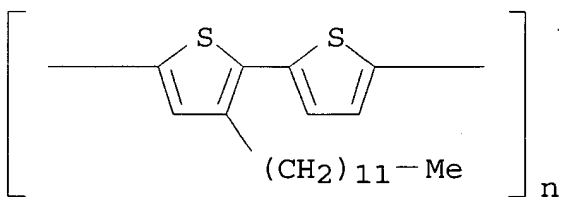
CMF C20 H29 Br S2



Me- (CH₂)₁₁

RN 350499-05-7 ZCA

CN Poly(3-dodecyl[2,2'-bithiophene]-5,5'-diyl) (9CI) (CA INDEX NAME)



20

IT 350499-04-6P 350499-05-7P
(synthesis of regioregular polythiophenes)

L15 ANSWER 6 OF 51 ZCA COPYRIGHT 2003 ACS

135:227352 Electrically Conducting Poly(undecylbithiophene)s. 1.

Regioselective Synthesis and Primary Structure. Kowalik, Janusz; Tolbert, Laren M.; Narayan, Sujatha; Abhiraman, A. S. (Schools of Chemistry and Biochemistry Textile and Fiber Engineering and Chemical Engineering, Polymer Education and Research Center Georgia Institute of Technology, Atlanta, GA, 30332, USA). Macromolecules, 34(16), 5471-5479 (English) 2001. CODEN: MAMOBX. ISSN:

0024-9297. Publisher: American Chemical Society.

AB Poly(undecyl bithiophene), formally an alternating copolymer of thiophene and 3-undecylthiophene, was synthesized via two different protocols. Direct oxidative polymn. of 3-undecyl-2,2'-bithiophene with ferric chloride in nitrobenzene (P3UBT-F) and transition-metal-mediated polymn. of 5-bromo-4-undecyl-5'-iodozincio-2,2'-bithiophene (P4UBT-R) were carried out. Surprisingly, both polythiophenes were found to possess similar spectral characteristics (vibrational spectroscopy, ^1H NMR) and yet different phys. properties. While P4UBT-R has ca. 90% of the head-to-tail motif, the regiochem. of P3UBT-F could not be established satisfactorily. The former has a higher level of conjugation, but the level of conjugation in P3UBT-F is still comparable to that reported in the literature for regioregular poly(3-alkylthiophene)s (P3AT). Preliminary cond. measurements show that the usually adverse effects of regio-irregular structures on conjugation and cond. can be suppressed substantially by the combination of mono-substitution and inside positioning of the pendant group on the bithiophene.

IT 168908-28-9P, 3-Undecyl-2,2'-bithiophene homopolymer
358718-75-9P

(regioselective synthesis route effect on structure and cond. of poly(undecylbithiophene)s)

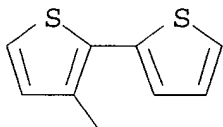
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



$(\text{CH}_2)_{10}-\text{Me}$

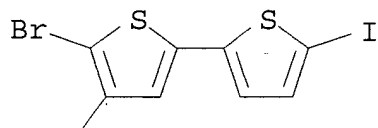
RN 358718-75-9 ZCA

CN 2,2'-Bithiophene, 5-bromo-5'-iodo-4-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 358718-74-8

CMF C19 H26 Br I S2



Me-(CH₂)₁₀

IT 168908-28-9P, 3-Undecyl-2,2'-bithiophene homopolymer
358718-75-9P

(regioselective synthesis route effect on structure and cond. of poly(undecylbithiophene)s)

L15 ANSWER 7 OF 51 ZCA COPYRIGHT 2003 ACS

135:182980 Poly(4-undecyl-2,2'-bithiophene) as a hole conductor in solid state dye sensitized titanium dioxide solar cells. Spiekermann, S.; Smestad, G.; Kowalik, J.; Tolbert, L. M.; Gratzel, M. (Institut de Chimie Physique (ICP-2), Ecole Polytechnique Federale de Lausanne, Lausanne, 1015, Switz.). Synthetic Metals, 121(1-3), 1603-1604 (English). 2001. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB Application of a spin-coated poly(4-undecyl-2,2'-bithiophene) layer on dye sensitized TiO₂ showed that it can act as an efficient charge mediator. Typical J-V values for flat TiO₂ film devices are J_{SC} = 60 .mu.A/cm², and V_{oc} = 0.65 V, which is comparable to values obtained with liq. electrolytes in the same geometrical configuration. The polymer is also able to sensitize the TiO₂ without a dye.

IT 168908-28-9 355113-83-6

(poly(4-undecyl-2,2'-bithiophene) as hole conductor in solid state dye sensitized titanium dioxide solar cells)

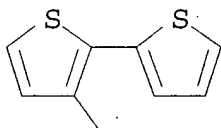
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



(CH₂)₁₀-Me

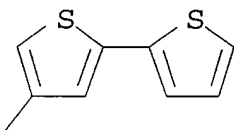
RN 355113-83-6 ZCA

CN 2,2'-Bithiophene, 4-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 355113-82-5

CMF C19 H28 S2

Me-(CH₂)₁₀

IT 168908-28-9 355113-83-6

(poly(4-undecyl-2,2'-bithiophene) as hole conductor in solid state dye sensitized titanium dioxide solar cells)

L15 ANSWER 8 OF 51 ZCA COPYRIGHT 2003 ACS

135:172299 Tunable optical properties of conducting polymers infiltrated in synthetic opal as photonic crystal. Yoshino, K.; Satoh, S.; Shimoda, Y.; Kajii, H.; Tamura, T.; Kawagishi, Y.; Matsui, T.; Hidayat, R.; Fujii, A.; Ozaki, M. (Department of Electronic Engineering, Graduate School of Engineering, Osaka University, Osaka, Japan). Synthetic Metals, 121(1-3), 1459-1462 (English) 2001. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB Various org. materials such as conducting polymers, insulating polymers, dyes, liq. crystals and carbons were infiltrated in synthetic opals made by sedimentation of SiO₂ spheres. Optical properties of the opals exhibit drastic changes upon these infiltration. By removing SiO₂ with HF, replicas of opals was prepd. with the infiltrated materials. Optical properties of synthetic opals infiltrated with conducting polymers are tuned by various factors such as temp. and electrochem. doping in synthetic opals infiltrated with poly(3-alkylthiophene). These tunabilities were interpreted in terms of the change of refractive index by temp. and doping. Tuning of the optical properties by various factors were also demonstrated in the opal replicas. Polymer opals made of polymer spheres of several hundreds nanometer in diam. also were prepd. and the mech. tuning was demonstrated. Upon optical excitation of the synthetic opals infiltrated with conducting polymers and fluorescent dyes, spectral narrowing and lasing were obsd. The behaviors are dependent on the emission wavelength and the periodicity of the opals and the solvents used for infiltration. Two-dimensional periodic structures were also fabricated upon irradiation of interfering optical beams on photo-polymers with azobenzene moieties in the side chains containing conducting polymers, in which directional PL emission were demonstrated.

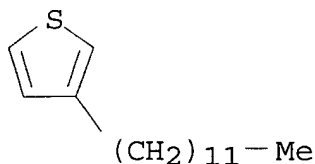
IT 352201-41-3, 3-Dodecylthiophene-2-octylthiophene copolymer (tunable optical properties of conducting polymers infiltrated in synthetic opal as photonic crystal)

RN 352201-41-3 ZCA

CN Thiophene, 3-dodecyl-, polymer with 2-octylthiophene (9CI) (CA INDEX NAME)

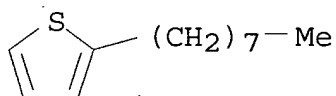
CM 1

CRN 104934-52-3
CMF C16 H28 S



CM 2

CRN 880-36-4
CMF C12 H20 S



IT 352201-41-3, 3-Dodecylthiophene-2-octylthiophene copolymer
(tunable optical properties of conducting polymers infiltrated in
synthetic opal as photonic crystal)

L15 ANSWER 9 OF 51 ZCA COPYRIGHT 2003 ACS

135:137954 Temperature and voltage dependent optical properties of
conducting polymer in synthetic opal as photonic crystal. Satoh,
S.; Kajii, H.; Kawagishi, Y.; Tamura, T.; Fujii, A.; Ozaki, M.;
McCullough, R. D.; Yoshino, K. (Department of Electronic
Engineering, Graduate School of Engineering, Osaka University,
Suita, Osaka, 565-0871, Japan). Synthetic Metals, 121(1-3),
1503-1504 (English) 2001. CODEN: SYMEDZ. ISSN:
0379-6779. Publisher: Elsevier Science S.A..

AB Conducting polymers can be infiltrated into a nanoscale
interconnected regular array of voids in synthetic opal. The
optical properties such as transmission and reflection spectra of
the synthetic opal infiltrated with conducting polymers have been
found to change drastically by changing temp. and voltage. Their
mechanism is interpreted to be based on the temp. dependence of
refractive index assocd. with the thermochromism and electrochem.
doping in conducting polymers. In this synthetic opal infiltrated
with conducting polymers, the optical properties have been confirmed
to be tunable by adjusting various conditions such as temp. and
applied voltage.

IT 352201-41-3
(temp. and voltage dependent optical properties of conducting
polymer in synthetic opal as photonic crystal)

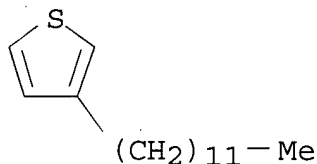
RN 352201-41-3 ZCA

CN Thiophene, 3-dodecyl-, polymer with 2-octylthiophene (9CI) (CA
INDEX NAME)

CM 1

CRN 104934-52-3

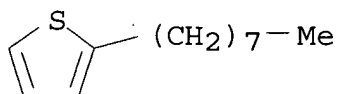
CMF C16 H28 S



CM 2

CRN 880-36-4

CMF C12 H20 S



IT 352201-41-3

(temp. and voltage dependent optical properties of conducting polymer in synthetic opal as photonic crystal)

L15 ANSWER 10 OF 51 ZCA COPYRIGHT 2003 ACS

135:123141 Preparation and properties of polythiophene derivatives. Masuda, H.; Asano, D. K.; Kaeriyama, K. (705-1 Shimoimaizumi, Kanagawa Industrial Technology Research Institute, Ebina, Kanagawa, 243-0435, Japan). Synthetic Metals, 119(1-3), 167-168 (English) 2001. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB Chem. prepd. poly(2-alkyl-2,2'-bithiophene)s (poly-ArBT) are found to be highly sol. and electrochem. prepd. ones less sol. The salts of copper (II) and iron (III) ions are found to be effective oxidants for the chem. polymn. of poly-ArBT, due to the low oxidn. potential of the bithiophene derivs. The conductivities of electrochem. prepd. polymers are found to be lower than those of chem. prepd. polymers and near to the cond. of poly(2,2'-bithiophene).

IT 119889-86-0P, Poly(3-dodecyl-2,2'-bithiophene)

141105-21-7P, Poly(3-hexyl-2,2'-bithiophene)

350694-17-6P

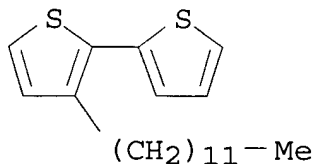
(prepn. and properties of polythiophene derivs.)

RN 119889-86-0 ZCA

CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

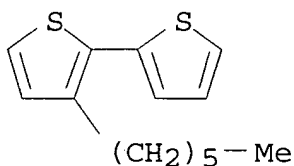
CRN 119889-85-9
CMF C20 H30 S2



RN 141105-21-7 ZCA
CN 2,2'-Bithiophene, 3-hexyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

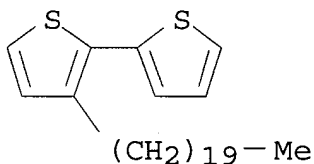
CRN 141102-61-6
CMF C14 H18 S2



RN 350694-17-6 ZCA
CN 2,2'-Bithiophene, 3-eicosyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 350694-16-5
CMF C28 H46 S2



IT 119889-86-0P, Poly(3-dodecyl-2,2'-bithiophene)
141105-21-7P, Poly(3-hexyl-2,2'-bithiophene)
350694-17-6P
(prepn. and properties of polythiophene derivs.)

L15 ANSWER 11 OF 51 ZCA COPYRIGHT 2003 ACS
135:107684 Synthesis and characterization of novel regioregular polythiophenes. Greve, Daniel R.; Apperloo, Joke J.; Janssen, Rene A. J. (Laboratory of Macromolecular and Organic Chemistry, PO Box 513, Eindhoven University of Technology, Eindhoven, 5600 MB, Neth.). Synthetic Metals, 119(1-3), 369-370 (English) 2001.
CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

AB Three novel regioregular polythiophenes with side chain substituents resulting in increased oxidn. potentials relative to poly(3-dodecylthiophene) were synthesized using the McCullough polymn. protocol. All the polymers have >95% head-to-tail couplings as evidenced from ¹H-NMR and are further characterized by SEC, soln. and solid-state UV-visible spectroscopy, and cyclic voltammetry. The redox properties could be altered by varying the nature of the side chains; the first oxidn. potentials vary between 0.75 V and 1.25 V and the first redn. potentials between -1.40 V and -1.85 V. The optical properties of the polymers in soln. and as thin solid films were much less affected by the different substituents.

IT 350499-04-6P 350499-05-7P

(synthesis by Grignard metathesis polymn. and characterization of regioregular head-to-tail polythiophenes)

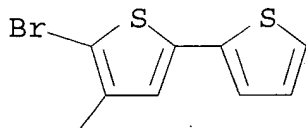
RN 350499-04-6 ZCA

CN 2,2'-Bithiophene, 5-bromo-4-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 350499-03-5

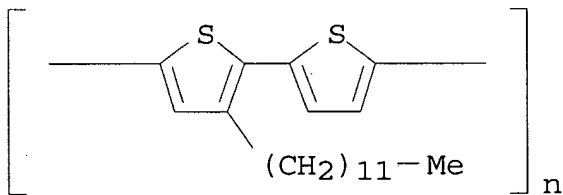
CMF C20 H29 Br S2



Me-(CH₂)₁₁

RN 350499-05-7 ZCA

CN Poly(3-dodecyl[2,2'-bithiophene]-5,5'-diyl) (9CI) (CA INDEX NAME)



IT 350499-04-6P 350499-05-7P

(synthesis by Grignard metathesis polymn. and characterization of regioregular head-to-tail polythiophenes)

L15 ANSWER 12 OF 51 ZCA COPYRIGHT 2003 ACS

135:46558 Highly conjugated poly(thiophene)s - synthesis of regioregular 3-alkylthiophene polymers and 3-alkylthiophene/thiophene copolymers. Lere-Porte, Jean-Pierre; Moreau, Joel J. E.; Torreilles, Christophe (Laboratoire de Chimie Organometallique, UMR CNRS 5076, Ecole Nationale Supérieure de Chimie, Montpellier, 34296, Fr.). European Journal of Organic Chemistry (7), 1249-1258 (English) 2001

CODEN: EJOCFK. ISSN: 1434-193X. Publisher: Wiley-VCH Verlag GmbH.

AB Tributyltin derivs. of 2-bromo-3-octylthiophene and 5-bromo-4-octyl-2,2'-bi(thiophene) were selectively prep'd. Condensation reactions in the presence of $\text{Pd}_2(\text{dba})_3(\text{CHCl}_3)/4 \text{ PPh}_3$ led to high yields (ca. 90%) of regioregular poly(3-octylthiophene) ($M_w = 21.4 \times 10^4$, $M_w/M_n = 1.48$) and poly[4-octylbithiophene] ($M_w = 3.8 \times 10^4$, $M_w/M_n = 1.1$). The regioregularity of the head-to-tail (HT) coupling was det'd. by ^1H NMR, which showed HT > 95% for poly(3-octylthiophene) and HT > 90% for poly[4-octylbithiophene]. The conjugation properties of the polythiophenes were characterized by FTIR and UV/Vis spectroscopy. Compared to the corresponding random polymers, the absorption maxima of the regular polymers are shifted to higher wavelengths ($\lambda_{\text{max}} = 448$ and 466 nm, resp.). The mean conjugation length increased with increasing regioregularity of the coupling and with fewer substituents along the conjugated chain. The electroactive properties of the conjugated polymers were studied. The poly[4-octylbithiophene] shows an oxidn. peak at low potential, and, compared to poly(3-octylthiophene), a redn. peak is also obs'd. at a lower potential indicating higher electron affinity. Both polymers exhibit reversible blue-red electrochromic behavior assoc'd. with the reversible redox processes.

IT 208448-68-4P, 4-Octyl-2,2'-bithiophene homopolymer
210432-18-1P, 5-Bromo-4-octyl-5'-tributylstannyl-2,2'-bithiophene homopolymer 210432-19-2P, 5-Bromo-4-octyl-5'-tributylstannyl-2,2'-bithiophene homopolymer, SRU
(prepn. and redox electrochem. of electrochromic regioregular poly(octylthiophene)s and poly(alkylbithiophene)s using Pd catalysts)

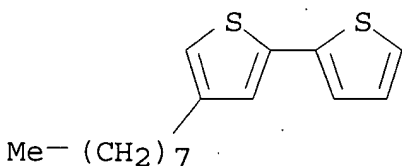
RN 208448-68-4 ZCA

CN 2,2'-Bithiophene, 4-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 188686-92-2

CMF C16 H22 S2



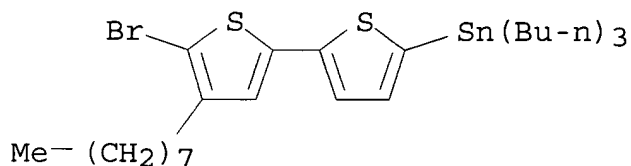
RN 210432-18-1 ZCA

CN Stannane, (5'-bromo-4'-octyl[2,2'-bithiophen]-5-yl)tributyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

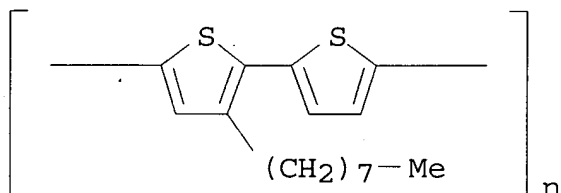
CRN 210432-16-9

CMF C28 H47 Br S2 Sn



RN 210432-19-2 ZCA

CN Poly(3-octyl[2,2'-bithiophene]-5,5'-diyl) (9CI) (CA INDEX NAME)



IT 208448-68-4P, 4-Octyl-2,2'-bithiophene homopolymer
 210432-18-1P, 5-Bromo-4-octyl-5'-tributylstannyl-2,2'-
 bithiophene homopolymer 210432-19-2P, 5-Bromo-4-octyl-5'-
 tributylstannyl-2,2'-bithiophene homopolymer, SRU
 (prepn. and redox electrochem. of electrochromic regioregular
 poly(octylthiophene)s and poly(alkylbithiophene)s using Pd
 catalysts)

L15 ANSWER 13 OF 51 ZCA COPYRIGHT 2003 ACS

134:281230 Electrochemical and optical properties of novel
 poly(3-substituted-2,2'-bithiophene)s. Miao, Ping; Zhang, Chun-Yan;
 Chan, Hardy S. O.; Ng, Siu-Choon (Department of Chemistry, National
 University of Singapore, Singapore, 119260, Singapore).
 Macromolecular Chemistry and Physics, 202(1), 1-7 (English)
 2001. CODEN: MCHPES. ISSN: 1022-1352. Publisher:
 Wiley-VCH Verlag GmbH.

AB The electrochem. and optical properties of poly(3-substituted-2,2'-
 bithiophene)s with bromo, alkyl, alkoxy, and alkylthio pendant
 groups and obtained by electrochem. polymn. were studied. As
 3-alkyl-thiophenes, 3-alkylthio-2,2'-bithiophenes cannot be
 electropolymd. although the polymer can be successfully generated
 via a chem. oxidative approach. Other monomers were successfully
 electropolymd. to afford uniform polymer films on the anode, using
 either Bu4NBF4-CH3CN or boron trifluoride di-Et etherate (BF3-OEt2)
 as electrolyte system. The two electrolytes exhibit contrasting
 effects on film formation mechanism and optoelectronic properties of
 the polybithiophenes with different pendants. The oxidn. potential
 of monomers in Bu4NBF4-CH3CN follows the trend: 3-methoxy-2,2'-
 bithiophene < 3-octylthio-2,2'-bithiophene < 2,2'-bithiophene <
 3-octyl-2,2'-bithiophene < 3-bromo-2,2'-bithiophene, while that of
 the polymers is: poly(3-methoxy-2,2'-bithiophene) <
 poly(3-octyl-2,2'-bithiophene) < poly(2,2'-bithiophene) <

poly(3-bromo-2,2'-bithiophene). However, in BF_3OEt_2 the trend of oxidn. potential for monomers is: 3-octylthio-2,2'-bithiophene < 2,2'-bithiophene < 3-bromo-2,2'-bithiophene < 3-octyl-2,2'-bithiophene < 3-methoxy-2,2'-bithiophene while that for polymers is: poly(3-octyl-2,2'-bithiophene) < poly(3-methoxy-2,2'-bithiophene) < poly(2,2'-bithiophene) < poly(3-bromo-2,2'-bithiophene). The p- and n-doping of poly(3-alkyl-2,2'-bithiophene)s is stable and reversible, in $\text{Bu}_4\text{NBF}_4\text{-CH}_3\text{CN}$. A thin film of P3BrBT had a $\pi\text{-}\pi^*$ absorption max. at 452 nm with onset at ca. 600 nm; the high transition energy arises from the electron withdrawing effects of Br groups. The $\pi\text{-}\pi^*$ absorption max. depicted two obvious vibration bands at 455 and 511 nm, indicative of high conjugation extent.

IT 150504-16-8P, Poly(3-Octyl-2,2'-bithiophene)
(prepn. and redox electrochem. and electronic transitions of poly(3-substituted-2,2'-bithiophene)s and effect of polymn. electrolyte system on properties)

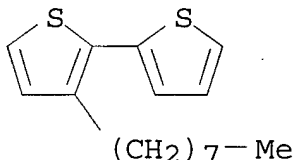
RN 150504-16-8 ZCA

CN 2,2'-Bithiophene, 3-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 150504-15-7

CMF C16 H22 S2



IT 150504-16-8P, Poly(3-Octyl-2,2'-bithiophene)
(prepn. and redox electrochem. and electronic transitions of poly(3-substituted-2,2'-bithiophene)s and effect of polymn. electrolyte system on properties)

L15 ANSWER 14 OF 51 ZCA COPYRIGHT 2003 ACS

132:223221 Synthesis and characterization of neutral newly substituted polyalkylthiophenes. Andreani, F.; Salatelli, E.; Lanzi, M.; Bertinelli, F.; Fichera, A. M.; Gazzano, M. (Dipartimento di Chimica Industriale e dei Materiali, University of Bologna, Bologna, 40136, Italy). Polymer, 41(9), 3147-3157 (English) 2000. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB In this work, two newly substituted polyalkylthiophenes, poly(3,4-dihexyl-2,2'-bithiophene) and its didodecyl analog have been prepd. in order to compare their properties with those of the regioisomeric poly(3-alkylthiophene)s contg. the same amt. of head-to-tail configuration (conventional PATs). Remarkable differences between the material characteristics of these two kinds of polyalkylthiophene have been obsd., thus enabling us to elucidate the side chains effects exclusively attributable to the difference

between the side chains distribution along the polythiophene backbone. In the neutral bulk state, compared to that of the conventional PATs, the polymers prep'd. for this study have been found more thermostable materials exhibiting higher flexibility and less ordered (in the crystallog. sense) mol. assemblies, still able to afford an av. conjugation length as long as that of the conventional PATs, but varying between wider limits. This seems to be closely connected with a lower degree of side chains interaction and/or the high proportion (50%) of unsubstituted thiophene rings. Based on these effects of mol. structure on the material properties at room temp., we have anticipated in the novel polymers, at higher temps., the possibility of weaker thermochromism and better cond. stability than in their regioisomeric conventional PATs.

IT 261379-10-6P 261379-11-7P

(synthesis of neutral substituted polyalkylthiophenes)

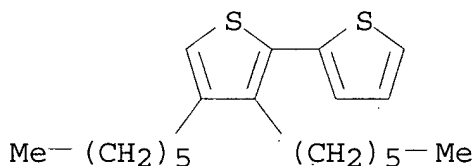
RN 261379-10-6 ZCA

CN 2,2'-Bithiophene, 3,4-dihexyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 261379-06-0

CMF C20 H30 S2



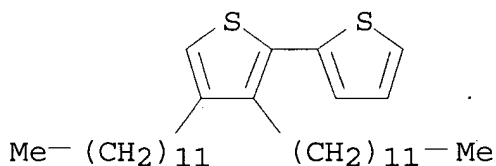
RN 261379-11-7 ZCA

CN 2,2'-Bithiophene, 3,4-didodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 261379-07-1

CMF C32 H54 S2



IT 261379-10-6P 261379-11-7P

(synthesis of neutral substituted polyalkylthiophenes)

L15 ANSWER 15 OF 51 ZCA COPYRIGHT 2003 ACS

131:337467 Synthesis and characterization of electrically conducting poly(undecyl bithiophene)s. Narayan, Sujatha (Georgia Institute of Technology, Atlanta, GA, USA). 190 pp. Avail. UMI, Order No.

DA9929339 From: Diss. Abstr. Int., B 1999, 60(5), 2322 (English) 1999.

AB Unavailable

IT **168908-28-9P**, 3-Undecyl-2,2'-bithiophene homopolymer
(synthesis and characterization of elec. conducting poly(undecyl bithiophene)s)

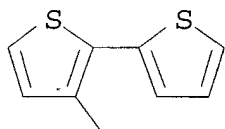
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



(CH₂)₁₀-Me

IT **168908-28-9P**, 3-Undecyl-2,2'-bithiophene homopolymer
(synthesis and characterization of elec. conducting poly(undecyl bithiophene)s)

L15 ANSWER 16 OF 51 ZCA COPYRIGHT 2003 ACS

131:323230 Synthesis and characterization of oligo- and crown ether-substituted polythiophenes - a comparative study. Scheib, Stefan; Bauerle, Peter (Abteilung Organische Chemie II, Universitat Ulm, Ulm, D-89081, Germany). Journal of Materials Chemistry, 9(9), 2139-2150 (English) 1999. CODEN: JMACEP. ISSN: 0959-9428. Publisher: Royal Society of Chemistry.

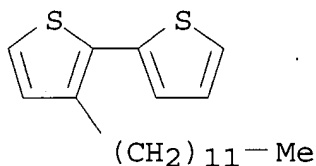
AB The synthesis of two series of thiophenes substituted with crown and oligoether groups either via isolating oxaalkyl chains or in direct .pi.-conjugation is described. Electrooxidative polymn. leads to the corresponding crown and oligoether-functionalized polythiophenes. Their electrochem. and spectroscopic properties depend on the length of the spacer and the type of the ether unit. The polymers reveal a high mean conjugation. A specific and strong influence of alkali ions on the electrochem. behavior is found for several polymers. The selectivities correspond to the match of the cation size without solvent shell and the inner diam. of the crown ether units. Spectroelectrochem. expts. corroborate that the changes in redox properties are due to a hindered diffusion of the counter anions into the film when the polymer is oxidized. Due to the structural variation novel materials sensitive to different cations are obtained. Importantly, in these conjugated polymers chem. information which corresponds to a selective host-guest interaction of the alkali metal cations and the ether units is transduced into the change of an elec. signal.

IT **119889-86-0P 249513-19-7P**
(prepn. and characterization of)

RN 119889-86-0 ZCA
 CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

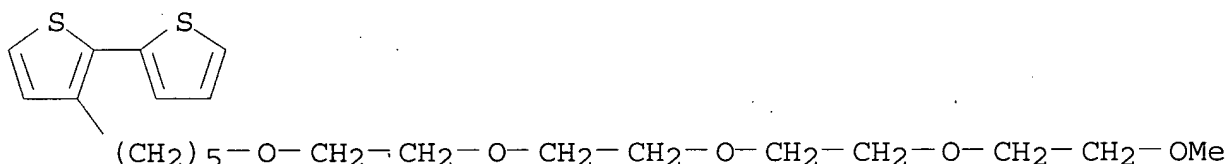
CRN 119889-85-9
 CMF C20 H30 S2



RN 249513-19-7 ZCA
 CN 2,5,8,11,14-Pentaoxanonadecane, 19-[2,2'-bithiophen]-3-yl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 249513-12-0
 CMF C22 H34 O5 S2



IT 119889-86-0P 249513-19-7P
 (prep. and characterization of)

L15 ANSWER 17 OF 51. ZCA COPYRIGHT 2003 ACS
 131:310971 Manufacture of organic electrically conductive microparticles with stable conductivity. Kobayashi, Motokazu; Fukui, Akio; Aoto, Hiroshi (Canon K. K., Japan). Jpn. Kokai Tokkyo Koho JP 11292957 A2 19991026 Heisei, 6 pp. (Japanese). CODEN: JKXXAF.
 APPLICATION: JP 1998-104366 19980415.

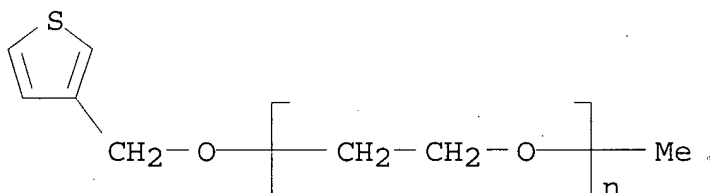
AB The microparticles are obtained from the copolymers of (selectively long-chain substituted) unsatd. 5-membered heterocyclic N compds. with other unsatd. 5-membered heterocyclic N compds. by the oxidative polymn. Thus, mixing 0.5 g 3-heneicosyliminocarbonylthiophene with 10 g FeCl₃.6H₂O in 70 mL water and 30 mL MeOH, adding 1 g pyrrole and mixing at 10.degree. for 24 h gave a polymer dispersion contg. particles with diam. 70 nm, and vol. resistance 0.28 and 0.30 .OMEGA..cm initially and after 30 days at 32.5.degree. and 80% humidity.

IT 247191-45-3P
 (manuf. of org. elec. conductive microparticles with stable cond.)

RN 247191-45-3 ZCA
 CN Poly(oxy-1,2-ethanediyl), .alpha.-methyl-.omega.-(3-thienylmethoxy)-
 , polymer with thiophene, graft (9CI) (CA INDEX NAME)

CM 1

CRN 247191-38-4
 CMF (C2 H4 O)_n C6 H8 O S
 CCI PMS



CM 2

CRN 110-02-1
 CMF C4 H4 S



IT **247191-45-3P**
 (manuf. of org. elec. conductive microparticles with stable
 cond.)

L15 ANSWER 18 OF 51 ZCA COPYRIGHT 2003 ACS

131:200732 Charge-transfer doping of poly(3-alkyl-2,2'-bithiophene).
 Tolbert, Laren; Edmond, Christine; Kowalik, Janusz (School of
 Chemistry and Biochemistry, Georgia Institute of Technology,
 Atlanta, GA, 30332-0400, USA). Synthetic Metals, 101(1-3), 500-501
 (English) 1999. CODEN: SYMEDZ. ISSN: 0379-6779.
 Publisher: Elsevier Science S.A..

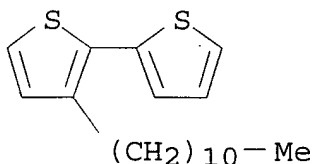
AB Spin-cast films of poly(3-undecyl-2,2'-bithiophene), a highly
 ordered, flexible, and sol. polythiophene, can be doped with solns.
 of dichlorodicyanoquinone (DDQ) to produce a highly conducting
 material. The doped films of the polybithiophene exhibit strong
 bipolaronic absorptions, consistent with the formation of
 charge-transfer polymers. Weaker dopants, e. g., benzoquinone, are
 not effective. The use of org. dopants of this type provides a
 superior method for prodn. of stable conductive materials,
 Spectroscopic and thin-film x-ray diffraction data support a
 charge-transfer mechanism.

IT **168908-28-9**, 3-Undecyl-2,2'-bithiophene homopolymer
 (charge-transfer doping of poly(3-alkyl-2,2'-bithiophene))

RN 168908-28-9 ZCA
 CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8
 CMF C19 H28 S2



IT **168908-28-9**, 3-Undecyl-2,2'-bithiophene homopolymer
 (charge-transfer doping of poly(3-alkyl-2,2'-bithiophene))

L15 ANSWER 19 OF 51 ZCA COPYRIGHT 2003 ACS

131:200161 Synthesis of regioregular poly(alkylbithiophenes) by an organometallic crosscoupling reaction. Lere-Porte, J.-P.; Moreau, J. J. E.; Torreilles, C. (Lab. Chimie Organometallique, ESA CNRS 5076, Heterochimie Moleculaire Macromoleculaire, Ecole Nationale Supérieure de Chimie de Montpellier, Montpellier, 34296, Fr.). Synthetic Metals, 101(1-3), 588-589 (English) 1999. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

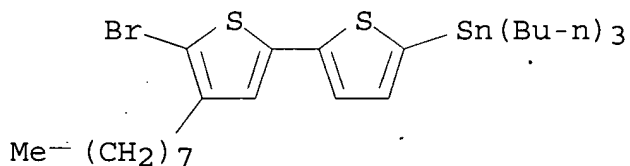
AB The synthesis of regioregular poly(alkylbithiophene) with more than 90% of head to tail coupling of bithiophene units is reported. The optical properties of the new polymer has been studied and indicated high conjugation length.

IT **210432-18-1P 210432-19-2P**
 (synthesis of regioregular poly(alkylbithiophenes) with high conjugation length by an organometallic crosscoupling reaction)

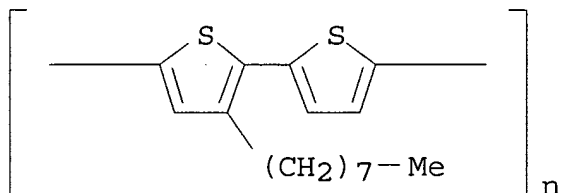
RN 210432-18-1 ZCA
 CN Stannane, (5'-bromo-4'-octyl[2,2'-bithiophen]-5-yl)tributyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 210432-16-9
 CMF C28 H47 Br S2 Sn



RN 210432-19-2 ZCA
 CN Poly(3-octyl[2,2'-bithiophene]-5,5'-diyl) (9CI) (CA INDEX NAME)



IT 210432-18-1P 210432-19-2P

(synthesis of regioregular poly(alkylbithiophenes) with high conjugation length by an organometallic crosscoupling reaction)

L15 ANSWER 20 OF 51 ZCA COPYRIGHT 2003 ACS

130:39001 Structure-property characterization of regiochemically defined conducting poly(3-undecyl bithiophene)s. Narayan, Sujatha; Desai, Prashant; Abhiraman, A. S.; Kowalik, Janusz; Tolbert, Laren (Polymer Education & Research Center, Georgia Institute of Technology, Atlanta, GA, 30332, USA). Annual Technical Conference - Society of Plastics Engineers, 56th(Vol. 2), 1258-1261 (English) 1998 . CODEN: ACPED4. ISSN: 0272-5223. Publisher: Society of Plastics Engineers.

AB Poly(3-alkyl thiophenes) (P3ATs) have been the subject of extensive research due to their high elec. cond. and easy processability. Poly(3-alkyl-2,2'-bithiophenes), where alternate thiophene rings are substituted with alkyl chains, are proposed as a potentially superior alternative. Regiochem. defined poly(3-undecyl bithiophene)s (P3UBTs) were synthesized and processed into films or fibers. The effect of regioregularity on the phys. structure and properties of the films was studied. UV-visible spectroscopy shows clearly that P3UBTs are significantly more conjugated than their P3AT analogs. Thermal anal., x-ray diffraction, dynamic mech. spectroscopy, etc., indicate that regioregularity is a key factor in detg. the structure and properties of P3UBTs. The regioregular P3UBT is significantly more cryst. and melts at a much higher temp., permitting a higher use temp., exhibits intra- as well as inter-mol. order and a significantly higher cond.

IT 168908-28-9, 3-Undecyl-2,2'-bithiophene homopolymer

(structure-property relationships in regiochem. defined conducting poly(3-undecyl bithiophene)s)

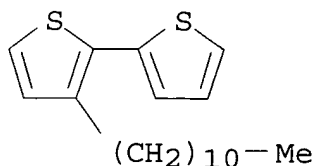
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



IT 168908-28-9, 3-Undecyl-2,2'-bithiophene homopolymer
(structure-property relationships in regiochem. defined
conducting poly(3-undecyl bithiophene)s)

L15 ANSWER 21 OF 51 ZCA COPYRIGHT 2003 ACS

130:31523 Synthesis & processing of regiochemically defined conducting poly(3-undecyl bithiophene)s. Narayan, Sujatha; Desai, Prashant; Abhiraman, A. S.; Kowalik, Janusz; Tolbert, Laren (Polymer Education & Research Center, Georgia Institute of Technology, Atlanta, GA, 30332, USA). Annual Technical Conference - Society of Plastics Engineers, 56th(Vol. 2), 1317-1320 (English) 1998. CODEN: ACPED4. ISSN: 0272-5223. Publisher: Society of Plastics Engineers.

AB Poly(3-alkyl thiophene)s (P3ATs) have demanded much attention from researchers in the last two decades due to their high elec. cond., environmental stability, and excellent processability. The current research focuses on the synthesis and processing of a proposed alternative - poly(3-alkyl 2-2' bithiophene). Two poly(3-undecyl bithiophene)s of different regioregularity were synthesized. The chem. structures of the two polymers were deduced through a variety of spectroscopic techniques. Currently, the polymers were processed into useful structures, such as films and fibers. The effect of processing and post-processing treatments on the elec. and mech. properties were investigated.

IT 168908-28-9, 3-Undecyl-2-2'-bithiophene homopolymer
(synthesis and processing of regiochem. defined conducting
poly(3-undecyl bithiophene)s)

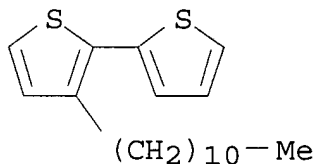
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



IT 168908-28-9, 3-Undecyl-2-2'-bithiophene homopolymer
(synthesis and processing of regiochem. defined conducting
poly(3-undecyl bithiophene)s)

L15 ANSWER 22 OF 51 ZCA COPYRIGHT 2003 ACS

129:122921 Coupling reaction, catalyzed by palladium, of the difunctional derivative Bu_3SnArBr . Synthesis of poly(3-alkylthiophenes) and poly(4-alkyl 2,2'-bithiophenes) that are regioregular and have a high molecular weight. Lere-Porte, J. -P.; Moreau, J. J. E.; Torreilles, C. (Laboratoire de Chimie Organometallique, ESA 5076 du CNRS, Ecole Nationale Supérieure de Chimie de Montpellier, Montpellier, 34296, Fr.). Journal de Chimie Physique et de Physico-Chimie Biologique, 95(6), 1250-1253 (French) 1998. CODEN: JCPBAN. ISSN: 0021-7689. Publisher: EDP Sciences.

AB The Pd-catalyzed organometallic coupling reactions of difunctional derivs. Bu_3SnArBr (Ar = 4-octyl-2,5-thiophenediyl or 4'-octyl-2,2'-bithiophene-5,5'-diyl) has been used to prep. regioregular poly(3-octylthiophenes) and poly(4-octyl-2,2'-bithiophenes) with high mol. wt.

IT 210432-18-1P 210432-19-2P
(prepn. of thiophene deriv. polymers by coupling of brominated tributylstannylthiophene derivs.)

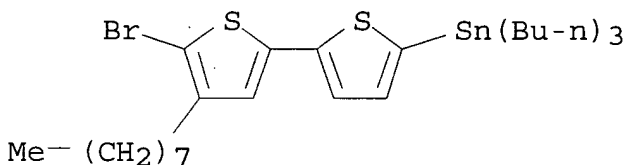
RN 210432-18-1 ZCA

CN Stannane, (5'-bromo-4'-octyl[2,2'-bithiophen]-5-yl)tributyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

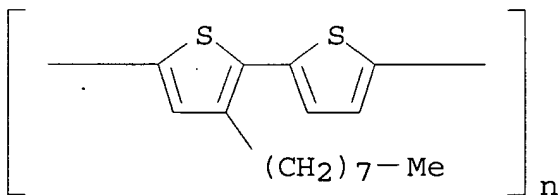
CRN 210432-16-9

CMF C28 H47 Br S2 Sn



RN 210432-19-2 ZCA

CN Poly(3-octyl[2,2'-bithiophene]-5,5'-diyl) (9CI) (CA INDEX NAME)



IT 210432-18-1P 210432-19-2P

(prepn. of thiophene deriv. polymers by coupling of brominated tributylstannylthiophene derivs.)

L15 ANSWER 23 OF 51 ZCA COPYRIGHT 2003 ACS

129:41471 A new, general approach to tuning the properties of functionalized polythiophenes: the oxidative polymerization of monosubstituted bithiophenes. Rasmussen, Seth C.; Pickens, Jason C.; Hutchison, James E. (Department of Chemistry and Materials Science Institute, University of Oregon, Eugene, OR, 97403, USA). Chemistry of Materials, 10(7), 1990-1999 (English) 1998. CODEN: CMATEX. ISSN: 0897-4756. Publisher: American Chemical Society.

AB A new synthetic approach to functionalized polythiophenes utilizing 4-substituted 2,2'-bithiophenes is described. The general utility of this approach is illustrated by the prepn. of the representative poly(4-substituted 2,2'-bithiophenes) (where substituent = octyl, hydroxymethyl, carboxy, carbomethoxy, or 2-acetoxyethyl). The use of monofunctionalized bithiophenes as monomers has a no. of advantages over traditional 3-substituted thiophene precursors. These advantages include direct oxidative polymn. of electron-poor monomers, selective oxidative polymn. in the presence of oxidatively sensitive side chains, polymn. without oxidative degrdn. of the backbone, and prodn. of polymers with decreased side-chain d. The combination of these advantages allows the facile oxidative polymn. of monomers contg. a large variety of functional groups. The redn. in side-chain d. results in polymers with increased effective conjugation lengths as evidenced by their improved elec. and optical properties.

IT 208448-68-4P, Poly(4-octyl-2,2'-bithiophene)
208448-69-5P, Poly[4-(2-acetoxyethyl)-2,2'-bithiophene]
(oxidative polymn. prepn. and optical and elec. properties of)

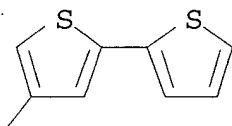
RN 208448-68-4 ZCA

CN 2,2'-Bithiophene, 4-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 188686-92-2

CMF C16 H22 S2



Me-(CH₂)₇

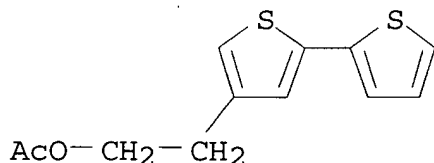
RN 208448-69-5 ZCA

CN [2,2'-Bithiophene]-4-ethanol, acetate, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 188686-91-1

CMF C12 H12 O2 S2



IT 208448-68-4P, Poly(4-octyl-2,2'-bithiophene)
 208448-69-5P, Poly[4-(2-acetoxyethyl)-2,2'-bithiophene]
 (oxidative polymn. prepn. and optical and elec. properties of)

L15 ANSWER 24 OF 51 ZCA COPYRIGHT 2003 ACS

128:230905 Effect of regioregularity on the physical structure & morphology of conducting poly(3-undecyl bithiophene)s. Narayan, Sujatha; Desai, Prashant; Abhiraman, A. S.; Kowalik, Janusz; Tolbert, Laren (Polymer Education and Research Center Georgia Tech, Atlanta, GA, 30332, USA). Polymer Preprints (American Chemical Society, Division of Polymer Chemistry), 39(1), 183-184 (English) 1998. CODEN: ACPPAY. ISSN: 0032-3934. Publisher: American Chemical Society, Division of Polymer Chemistry.

AB Conducting polymers have been the subject of avid interest in the last 2 decades, but they face serious problems in terms of processability, environmental stability, etc. Current research focuses on poly(3-alkylbithiophenes), which are proposed superior alternative to the traditional poly(3-alkylthiophenes). Regioregularity is a significant factor that influences the phys. structure and elec. properties of such polymers. Two poly(3-undecylbithiophenes) of vastly different regioregularities were synthesized, followed by characterization of chem. structure, phys. structure and elec. properties. The relationship between regioregularity, phys. and morphol. structure, and elec. properties are outlined.

IT 168908-28-9
 (regioregularity in relation to phys. structure and morphol. of conducting poly(undecylbithiophene)s)

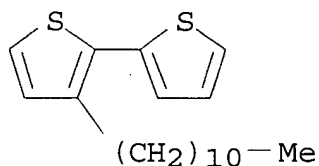
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



IT 168908-28-9

(regioregularity in relation to phys. structure and morphol. of conducting poly(undecylbithiophene)s)

L15 ANSWER 25 OF 51 ZCA COPYRIGHT 2003 ACS

128:35245 Highly conjugated alternated poly(3-octylthiophene-co-thiophene). Bolognesi, A.; Bertini, F.; Consonni, R.; Mendichi, R.; Giacometti Schieroni, A.; Provasoli, A. (Istituto Chimica Macromolecole, Milan, I-20133, Italy). Acta Polymerica, 48(11), 507-512 (English) 1997. CODEN: ACPODY. ISSN: 0323-7648. Publisher: Wiley-VCH Verlag GmbH.

AB A sol. copolymer formed by thiophene and 3-octylthiophene was obtained by using Ni catalyst polymn. The nearly alternated structure allows the formation of a highly conjugated system although the copolymer microstructure is not regioregular. ¹H-NMR, GPC characterization, and pyrolysis expts. support the alternated structure of the copolymer. Moreover, theor. calcns. indicate that the av. angle between adjacent monomeric units was reduced, in agreement with the obsd. shift towards lower energy of the electronic spectra of this alternated structure.

IT 199786-82-8P

(prepn. and chain sequence of)

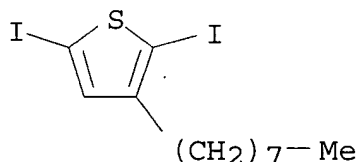
RN 199786-82-8 ZCA

CN Thiophene, 2,5-diiodo-3-octyl-, polymer with 2,5-dibromothiophene (9CI) (CA INDEX NAME)

CM 1

CRN 118677-11-5

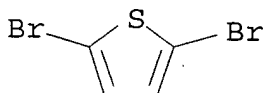
CMF C12 H18 I2 S



CM 2

CRN 3141-27-3

CMF C4 H2 Br2 S



IT 199786-82-8P

(prepn. and chain sequence of)

L15 ANSWER 26 OF 51 ZCA COPYRIGHT 2003 ACS

126:293707 Synthesis and molecular recognition properties of DNA- and RNA-base-functionalized oligo- and polythiophenes. Emge, A.; Baeuerle, P. (Abteilung Organische Chemie II, Universitaet Ulm, Albert-Einstein-Allee 11, Ulm, 89081, Germany). *Synthetic Metals*, 84(1-3), 213-214 (English) 1997. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier.

AB An uracil-substituted bithiophene, the corresponding poly(uracil bithiophene) and an end-capped terthiophene were synthesized and mol. recognition activity was evaluated as the response to complementary bases, N-acetyl-9-octyladenine or 2,4-diacetamido-6-pentoxypyrimidine. Both uracil-substituted bithiophene and poly(bithiophene) show a modification in the cyclic voltammograms in the presence of a complementary adenine deriv., while the electrochem. properties of the uracil-substituted end-capped terthiophene were not altered. The electroactivity of poly(uracil-bithiophene) decreased and oxidn. occurred at more pos. potentials. This change in the electroactivity is attributed to modifications of hydrogen bonding interactions in the conjugated system of the conducting polymers which are different also depending on the electrolyte solvent, CH₂Cl₂, PhNO₂, or MeCN with Bu₄NPF₆.

IT 119889-86-0, Poly(3-dodecyl-2,2'-bithiophene)
(synthesis and mol. recognition properties of uracil-bithiophenes and poly(uracil bithiophenes))

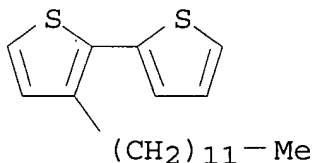
RN 119889-86-0 ZCA

CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9

CMF C20 H30 S2



IT 119889-86-0, Poly(3-dodecyl-2,2'-bithiophene)
(synthesis and mol. recognition properties of uracil-bithiophenes and poly(uracil bithiophenes))

L15 ANSWER 27 OF 51 ZCA COPYRIGHT 2003 ACS

126:278040 Stability of poly(3-alkylthiophene) doped with copper(II) perchlorate. Masuda, H.; Asano, D. K.; Kaeriyama, K. (Cooperative Research and Development Center, Yokohama National University, Tokiwadai 156, Hodogaya-ku, Yokohama, 240, Japan). *Synthetic Metals*, 84(1-3), 209-210 (English) 1997. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier.

AB Poly(3-dodecyl-2,2'-bithiophene), poly(3-dodecylthiophene), and poly(3,4-dibutoxythiophene) were chem. prepd. and doped with Cu(ClO₄)₂. The cond., stability and spectral change of the doped

polymers during storage in air were compared. The results suggest that $\text{Cu}(\text{ClO}_4)_2$ is an effective oxidant.

IT 119889-86-0, Poly(3-dodecyl-2,2'-bithiophene)
(cond., stability and spectral change of $\text{Cu}(\text{ClO}_4)_2$ -doped polythiophenes)

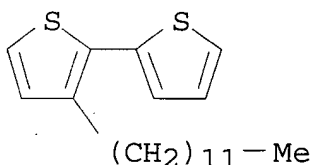
RN 119889-86-0 ZCA

CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9

CMF C20 H30 S2



IT 119889-86-0, Poly(3-dodecyl-2,2'-bithiophene)
(cond., stability and spectral change of $\text{Cu}(\text{ClO}_4)_2$ -doped polythiophenes)

L15 ANSWER 28 OF 51 ZCA COPYRIGHT 2003 ACS

125:11585 A soluble and electrically conducting polymer system incorporating thiophene and acetylenic moieties. Sarkar, Abhijit; San, Leong L.; Chan, Hardy S. O.; Ng, Siu C. (Department Chemistry, National University Singapore, Singapore, 0511, Singapore). Polymers and Other Advanced Materials: Emerging Technologies and Business Opportunities, [Proceedings of the International Conference on Frontiers of Polymers and Advanced Materials], 3rd, Kuala Lumpur, Jan. 16-20, 1995, Meeting Date 1995, 355-360. Editor(s): Prasad, Paras N.; Mark, James E.; Tung, Joo Fai. Plenum: New York, N. Y. (English) 1995. CODEN: 62SQAQ.

AB A series of monomers contg. thiophene and acetylenic moieties is prepd. and electrochem. polymd. Structural characteristics, band gap energy, and cyclic voltametric behavior of these conducting polymers are reported.

IT 177261-15-3P
(prepn. and characterization of sol. and elec. conducting polymers having thiophene and acetylenic moieties)

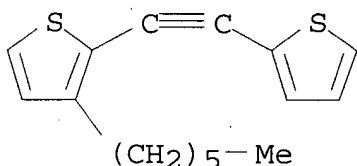
RN 177261-15-3 ZCA

CN Thiophene, 3-hexyl-2-(2-thienylethynyl)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 177261-11-9

CMF C16 H18 S2



IT 177261-15-3P

(prepn. and characterization of sol. and elec. conducting polymers having thiophene and acetylenic moieties)

L15 ANSWER 29 OF 51 ZCA COPYRIGHT 2003 ACS

124:274708 Fast responding solid state display device with excellent durability. Sato, Masaharu; Yagata, Hiroshi (Nippon Electric Co, Japan). Jpn. Kokai Tokkyo Koho JP 08043864 A2 **19960216** Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-175612 19940727.

AB The title device comprises a thin film layer interposed between a pair of electrodes, where the thin layer is made of a surface-oriented 5-membered heterocyclic compd. polymer capable of changing its absorption spectrum upon a voltage-induced conformation change. The 5-membered heterocyclic compd. may be thiophene or thiophene deriv.

IT **150321-37-2**, 3-Octylthiophene-thiophene copolymer
(thin film layer of fast responding solid state display device with excellent durability)

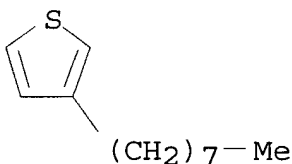
RN 150321-37-2 ZCA

CN Thiophene, 3-octyl-, polymer with thiophene (9CI) (CA INDEX NAME)

CM 1

CRN 65016-62-8

CMF C12 H20 S



CM 2

CRN 110-02-1

CMF C4 H4 S



IT 150321-37-2, 3-Octylthiophene-thiophene copolymer
(thin film layer of fast responding solid state display device
with excellent durability)

L15 ANSWER 30 OF 51 ZCA COPYRIGHT 2003 ACS

124:206781 Studies of the thermal degradation of polythiophenes by
pyrolysis-gas chromatography. Selsbo, Pernille; Ericsson, Enger
(Dep. of Analytical Chemistry, Univ. of Lund, Lund, S-221 00,
Swed.). Polymer Degradation and Stability, 51(1), 83-92 (English)
1996. CODEN: PDSTDW. ISSN: 0141-3910. Publisher:
Elsevier.

AB The thermal degrdn. products of four polythiophenes were
investigated by using pyrolysis-gas chromatog. with a flame
ionization detector (FID) and a sulfur-selective flame photometric
detector (FPD). The influence of pyrolysis temp. (550-1400.degree.)
and sample size (5-20 .mu.g) were studied, and the rates of
formation and yields of sulfur and hydrocarbons were detd. At low
temps. most of the sulfur was found as H2S and the most abundant
hydrocarbons were hexane and heptene. At high temps. CS2 and C1,2
hydrocarbons were formed secondarily. Only a small amt. of
thiophenes was found. The ratio between the hydrocarbons changed
somewhat with sample size, because of a change of the temp. gradient
in the sample. Rates of formation for C6 and C7 hydrocarbons were
the same for the different polythiophenes. The different chem.
environment of the thiophenic ring influenced the rate of formation
of H2S and the yield of sulfur. The yields of the arom. and
thiophenic hydrocarbons were much less than aliphatics, because of a
higher degree of carbonization for the arom. and thiophenic
hydrocarbons.

IT 150504-16-8
(study of thermal degrdn. of polythiophenes by pyrolysis-gas
chromatog.)

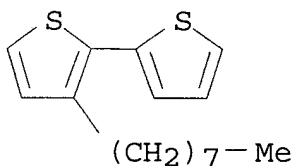
RN 150504-16-8 ZCA

CN 2,2'-Bithiophene, 3-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 150504-15-7

CMF C16 H22 S2



IT 150504-16-8
(study of thermal degrdn. of polythiophenes by pyrolysis-gas
chromatog.)

L15 ANSWER 31 OF 51 ZCA COPYRIGHT 2003 ACS

124:203164 A New Poly(3-alkylthiophene) Synthesis via Pd-Catalyzed Coupling of Thienyl Mercuric Chlorides. Curtis, M. David; McClain, Mark D. (Department of Chemistry, University of Michigan, Ann Arbor, MI, 48109-1055, USA). Chemistry of Materials, 8(4), 936-44 (English) 1996. CODEN: CMATEX. ISSN: 0897-4756. Publisher: American Chemical Society.

AB A new coupling reaction based on the Pd-catalyzed reductive coupling of thienyl mercuric chlorides is described. A variety of substituted thiophenes react with HgCl_2 to produce thienyl mercuric chlorides. The degree of substitution can be controlled by the choice of temp., solvent, and reaction time, and the resulting chloromercury thiophenes or bis(chloromercury)thiophenes are stable to air and water. Heating the thienyl mercuric chlorides in pyridine solvent with Cu powder and PdCl_2 catalyst gave good yields of the coupled thiophenes. Poly(alkyl)thiophenes, poly(alkyl thienylacetate esters), and copolymers of alkylthiophenes with unsubstituted thiophene were formed in good yields. Mol. wts., Mw, were in the range 5300-83000. This coupling reaction was compatible with the presence of an electrophilic substituent that is attacked by more nucleophilic intermediates, e.g., thienyllithium or thienyl Grignard reagents. Thus, this synthesis should be compatible with substituents known to be unreactive toward arylmercuric chlorides or arylpalladium compds. and is therefore complementary to the organometallic coupling schemes currently in use.

IT 162049-40-3P

(poly(alkylthiophene) synthesis via Pd-catalyzed coupling of thienyl mercuric chlorides)

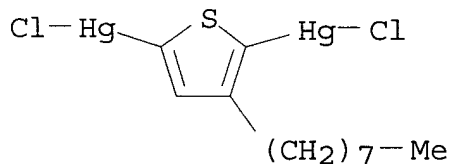
RN 162049-40-3 ZCA

CN Mercury, dichloro[.mu.-(3-octyl-2,5-thiophenediyl)]di-, polymer with dichloro-.mu.-2,5-thiophenediyl dimercury (9CI) (CA INDEX NAME)

CM 1

CRN 162049-39-0

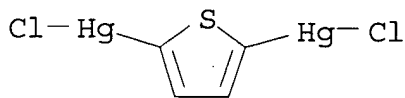
CMF C12 H18 Cl2 Hg2 S



CM 2

CRN 43030-22-4

CMF C4 H2 Cl2 Hg2 S



IT 162049-40-3P

(poly(alkylthiophene) synthesis via Pd-catalyzed coupling of thienyl mercuric chlorides)

L15 ANSWER 32 OF 51 ZCA COPYRIGHT 2003 ACS

124:56865 Novel Poly(3-alkylthiophene) and Poly(3-alkylthienyl ketone) Syntheses via Organomercurials. [Erratum to document cited in CA122:214710]. McClain, Mark D.; Whittington, Douglas A.; Mitchell, Deanna J.; Curtis, M. David (Department of Chemistry, University of Michigan, Ann Arbor, MI, 48109-1055, USA). Journal of the American Chemical Society, 117(22), 6152 (English) 1995. CODEN: JACSAT. ISSN: 0002-7863. Publisher: American Chemical Society.

AB The errors were not reflected in the abstr. or the index entries.

IT 162049-40-3P

(prepn. via organomercurials and characterization of poly(3-alkylthiophene) and poly(3-alkylthienyl ketones) (Erratum))

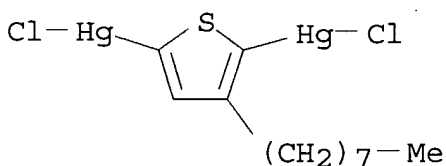
RN 162049-40-3 ZCA

CN Mercury, dichloro[.mu.-(3-octyl-2,5-thiophenediyl)]di-, polymer with dichloro-.mu.-2,5-thiophenediylmercury (9CI) (CA INDEX NAME)

CM 1

CRN 162049-39-0

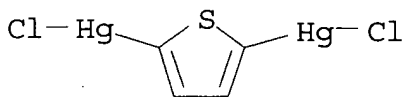
CMF C12 H18 Cl2 Hg2 S



CM 2

CRN 43030-22-4

CMF C4 H2 Cl2 Hg2 S



IT 162049-40-3P

(prepn. via organomercurials and characterization of

poly(3-alkylthiophene) and poly(3-alkylthienyl ketones)
(Erratum))

L15 ANSWER 33 OF 51 ZCA COPYRIGHT 2003 ACS

123:229161 Poly-(3-undecanylthiophene-co-thiophene), a novel approach to highly organized polyheterocycles. Kowalik, Janusz; Tolbert, Laren; Ding, Y.; Bottomley, L. A. (Georgia Institute Technology, School Chemistry and Biochemistry, Atlanta, GA, 30332, USA). Polymeric Materials Science and Engineering, 72, 325-6 (English) 1995 . CODEN: PMSEGD. ISSN: 0743-0515. Publisher: American Chemical Society.

AB 3-Undecyl-2,2'-bithiophene was prepd. and polymd. oxidatively and the polymer was characterized IR, electronic, and NMR spectroscopy and x-ray diffraction.

IT 168908-28-9P, 3-Undecyl-2,2'-bithiophene homopolymer (poly(3-undecylthiophene-co-thiophene), a novel approach to highly organized polyheterocycles)

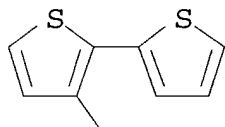
RN 168908-28-9 ZCA

CN 2,2'-Bithiophene, 3-undecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 168908-27-8

CMF C19 H28 S2



(CH₂)₁₀-Me

IT 168908-28-9P, 3-Undecyl-2,2'-bithiophene homopolymer (poly(3-undecylthiophene-co-thiophene), a novel approach to highly organized polyheterocycles)

L15 ANSWER 34 OF 51 ZCA COPYRIGHT 2003 ACS

123:70355 Soluble, conductive copolymer, the preparation and use thereof. De Ruiter, Barteld; Kock, Theodorus Johannes Jacobu (Nederlandse Organisatie voor Toegepast-Natuurwet, Neth.). PCT Int. Appl. WO 9500882 A1 19950105, 15 pp. DESIGNATED STATES: W: AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, TJ, TT, UA, US, UZ, VN; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). CODEN: PIXXD2. APPLICATION: WO 1994-NL144 19940620. PRIORITY: NL 1993-1085 19930622.

AB A sol. copolymer is described which is conductive as a result of the presence of a conjugated system, which copolymer contains, in side chains, functional groups as well as groups conferring soly., it being possible for the polymer chains to be covalently bonded to 1

another via the functional groups, which yields a cured copolymer network. A method for the prepn. of the polymer, a method for the prodn. of a conductive pattern by metalization, preferably via an electrolytic process on a conductive pattern, and a conductive pattern obtained in this way are also described.

IT 165179-10-2

(Sol. copolymer for conductive pattern)

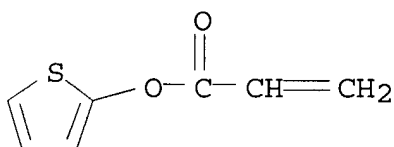
RN 165179-10-2 ZCA

CN 2-Propenoic acid, 2-thienyl ester, polymer with 3-hexylthiophene (9CI) (CA INDEX NAME)

CM 1

CRN 165179-09-9

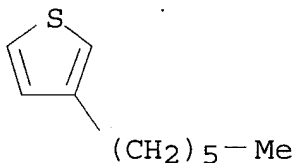
CMF C7 H6 O2 S



CM 2

CRN 1693-86-3

CMF C10 H16 S



IT 165179-10-2

(Sol. copolymer for conductive pattern)

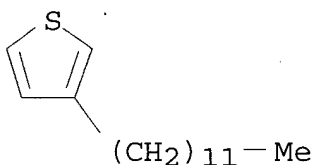
L15 ANSWER 35 OF 51 ZCA COPYRIGHT 2003 ACS

122:240596 The first synthesis and new properties of regio-regular, head-to-tail coupled polythiophenes. McCullough, Richard D.; Williams, Shawn P.; Tristram-Nagle, Stephanie; Jayaraman, Manikandan; Ewbank, Paul C.; Miller, Lynnette (Department of Chemistry, Carnegie Mellon Univ., Pittsburgh, PA, 15213, USA). Synthetic Metals, 69(1-3), 279-82 (English) 1995. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier.

AB The prepn. of polythiophene derivs. with essentially 100% head-to-tail (HT) couplings are presented, which leads to new defect free polythiophenes. These new HT polythiophenes formed self-oriented three dimensional structures with greatly enhanced two dimensional cond. The structure and properties of HT-substituted

polythiophenes are quite sensitive to the side chains attached to the polymer backbone.

IT **162339-14-2P**
 (head-to-tail; synthesis and properties of regio-regular, head-to-tail coupled polythiophenes)
 RN 162339-14-2 ZCA
 CN Thiophene, 3-dodecyl-, polymer with thiophene, alternating (9CI)
 (CA INDEX NAME)
 CM 1
 CRN 104934-52-3
 CMF C16 H28 S



CM 2
 CRN 110-02-1
 CMF C4 H4 S



IT **162339-14-2P**
 (head-to-tail; synthesis and properties of regio-regular, head-to-tail coupled polythiophenes)

L15 ANSWER 36 OF 51 ZCA COPYRIGHT 2003 ACS
 122:214710 Novel Poly(3-alkylthiophene) and Poly(3-alkylthienyl ketone) Syntheses via Organomercurials. McClain, Mark D.; Whittington, Douglas A.; Mitchell, Deanna J.; Curtis, M. David (Department of Chemistry, University of Michigan, Ann Arbor, MI, 48109-1055, USA). Journal of the American Chemical Society, 117(13), 3887-8 (English) 1995. CODEN: JACSAT. ISSN: 0002-7863. Publisher: American Chemical Society.

AB Synthesis of poly(3-alkylthiophenes) based on the coupling of bis(2,5-chloromercurio)-3-alkylthiophenes are reported. A new class of polymers, poly(3-alkylthienyl ketones) are prepd. by alternating polymn. of bis(2,5-chloromercurio)-3-alkylthiophenes with CO. Elec. cond. of iodine-doped 3-alkylthiophene-thiophene copolymers increased with increasing thiophene content from 6.times.10⁻² to 1.9 S/cm.

IT **162049-40-3P**

(prepn. via organomercurials and characterization of
poly(3-alkylthiophene) and poly(3-alkylthienyl ketones))

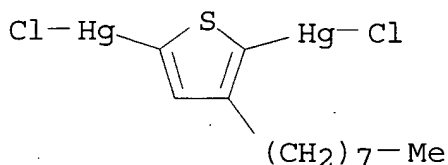
RN 162049-40-3 ZCA

CN Mercury, dichloro[.mu.-(3-octyl-2,5-thiophenediyl)]di-, polymer with
dichloro-.mu.-2,5-thiophenediylmercury (9CI) (CA INDEX NAME)

CM 1

CRN 162049-39-0

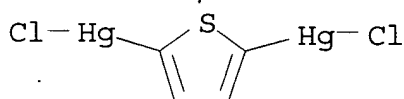
CMF C12 H18 Cl2 Hg2 S



CM 2

CRN 43030-22-4

CMF C4 H2 Cl2 Hg2 S



IT 162049-40-3P

(prepn. via organomercurials and characterization of
poly(3-alkylthiophene) and poly(3-alkylthienyl ketones))

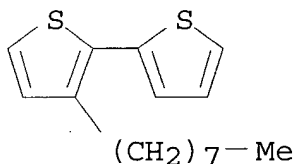
L15 ANSWER 37 OF 51 ZCA COPYRIGHT 2003 ACS

122:161884 X-ray structural studies of various octyl-substituted
polythiophenes. Mardalen, Jostein; Fell, Hans Joerg; Samuelsen,
Emil J.; Bakken, Eivind; Carlsen, Per H. J.; Andersson, Mats R.
(European Synchrotron Radiation Facility, Grenoble, F-38043, Fr.).
Macromolecular Chemistry and Physics, 196(2), 553-65 (English)
1995. CODEN: MCHPES. ISSN: 1022-1352. Publisher: Huethig
& Wepf.

AB The structure of poly(octylthiophene)s and alternating
octylthiophene-thiophene-copolymers with a varying degree of
intrachain regularity was studied by means of X-ray diffraction and
optical absorption measurements. Although these polymers show
varying degree of crystallinity, evidence is found that they all
tend to pack as relatively straight parallel chains. The lateral
packing distance depends strongly on the regularity and the relative
amt. of alkyl side chains. Generally poly(thiophene)s with a larger
relative amt. and higher stereoregularity of the octyl side chains
tend to pack more ordered. On the other hand, a large conjugation
length (high degree of chain planarity), as revealed by optical

absorption spectroscopy, and a cryst. packing of the polymer chains are not found to be interdependent. For the polymer with highest degree of crystallinity two surprisingly different cryst. structures were found for the two versions with different regularity, viz. poly(3-octylthiophene) and poly(3,3'-dioctyl-2,2'-bithiophene). For the latter the authors find evidence of a polymer chain twist between adjacent head-to-head coupled thiophene rings, and we propose a structural model for its cryst. packing. The new model can explain previously measured differences in spectroscopic and transport-related properties for these two stoichiometrically identical polymers.

IT 150504-16-8, Poly(3-dioctyl-2,2'-bithiophene)
 (x-ray structural studies of various octyl-substituted polythiophenes)
 RN 150504-16-8 ZCA
 CN 2,2'-Bithiophene, 3-octyl-, homopolymer (9CI) (CA INDEX NAME)
 CM 1
 CRN 150504-15-7
 CMF C16 H22 S2



IT 150504-16-8, Poly(3-dioctyl-2,2'-bithiophene)
 (x-ray structural studies of various octyl-substituted polythiophenes)

L15 ANSWER 38 OF 51 ZCA COPYRIGHT 2003 ACS
 122:161603 The tuning of conjugation by recipe: the synthesis and properties of random head-to-tail poly(3-alkylthiophene) copolymers. McCullough, Richard D.; Jayaraman, Manikandan (Dep. Chem., Carnegie Mellon Univ., Pittsburgh, PA, 15213-3890, USA). Journal of the Chemical Society, Chemical Communications (2), 135-6 (English) 1995. CODEN: JCCCAT. ISSN: 0022-4936. Publisher: Royal Society of Chemistry.

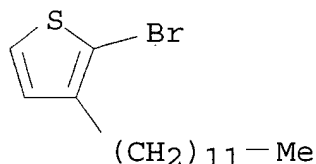
AB Regioregular head-to-tail coupled poly(3-alkylthiophene) random copolymers were prepd. and show that the conjugation can be tuned by variation of the length and relative ratios of the alkyl side chains.

IT 161534-50-5P, 5-Bromo-4-dodecyl-2-thiophene-5-bromothiophene copolymer
 (prepn. and properties of regioregular head-to-tail alkylthiophene random copolymers)

RN 161534-50-5 ZCA
 CN Thiophene, 2-bromo-3-dodecyl-, polymer with 2-bromothiophene (9CI)
 (CA INDEX NAME)

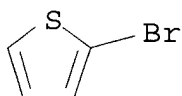
CM 1

CRN 139100-06-4
 CMF C16 H27 Br S



CM 2

CRN 1003-09-4
 CMF C4 H3 Br S



IT 161534-50-5P, 5-Bromo-4-dodecyl-2-thiophene-5-bromothiophene
 copolymer
 (prepn. and properties of regioregular head-to-tail
 alkylthiophene random copolymers)

L15 ANSWER 39 OF 51 ZCA COPYRIGHT 2003 ACS

122:106693 Electrochemical polymerization of 3-alkyl-2,2'-bithiophene.
 Masuda, Hideyuki; Kaeriyama, Kyoji; Suezawa, Hiroko; Hirota, Minoru
 (Ind. Res. Inst. Kanagawa Prefect., Yokohama, 236, Japan). Kenkyu
 Hokoku - Kanagawa-ken Kogyo Shikensho, Volume Date 1993, 64, 68-73
 (Japanese) 1994. CODEN: KKSKAU. ISSN: 0451-3169.

AB Grignard coupling of 3-bromo-2,2'-bithiophene with $\text{Me}(\text{CH}_2)_n\text{MgBr}$ ($n = 11$ and 5) gave 3-dodecyl-2,2'-bithiophene (I) and 3-hexyl-2,2'-bithiophene (II), resp. These bithiophenes were electrochem. polymd. in $\text{Bu}_4\text{NBF}_4/\text{MeCN}$ to form elec. conductive films. The cond. of I homopolymer and II homopolymer films were 1.3 and 1.4 S/cm, resp., which were comparable to that of poly(2,2'-bithiophene) film. Absorption spectra of the films in the as-grown state were similar to each other. The spectral change of I homopolymer film by electrochem. doping was different from that of polythiophene film. Solvent effect on the spectrum of I homopolymer film was also described.

IT 119889-86-0P, Poly(3-dodecyl-2,2'-bithiophene)
 141105-21-7P, Poly(3-hexyl-2,2'-bithiophene)
 (prepn. and elec. cond. of poly(3-alkyl-2,2'-bithiophene) films)

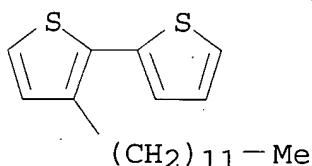
RN 119889-86-0 ZCA

CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9

CMF C20 H30 S2



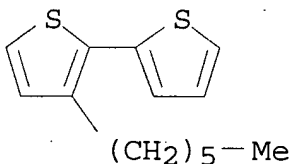
RN 141105-21-7 ZCA

CN 2,2'-Bithiophene, 3-hexyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 141102-61-6

CMF C14 H18 S2



IT 119889-86-0P, Poly(3-dodecyl-2,2'-bithiophene)

141105-21-7P, Poly(3-hexyl-2,2'-bithiophene)

(prepn. and elec. cond. of poly(3-alkyl-2,2'-bithiophene) films)

L15 ANSWER 40 OF 51 ZCA COPYRIGHT 2003 ACS

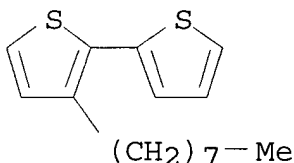
121:206472 Thermochromism and optical absorption in Langmuir-Blodgett films of alkyl-substituted polythiophenes. Ahlskog, M.; Paloheimo, J.; Stubb, H.; Dyreklev, P.; Fahlman, M.; Inganaes, O.; Andersson, M. R. (Semiconductor Lab., Technical Research Centre of Finland, Espoo, SF-02150, Finland). Journal of Applied Physics, 76(2), 893-9 (English) 1994. CODEN: JAPIAU. ISSN: 0021-8979.

AB Thermochromism and optical absorption in mono- and multilayers of Langmuir-Blodgett films of poly(3-alkylthiophenes), poly(3-octyl-2,2'-bithiophene), and poly(3'-octyl-2,2';5',2"-terthiophene) were studied. In sparsely alkylated polythiophenes the magnitudes of the thermochromic shift was smaller than in poly(3-alkylthiophenes) and roughly proportional to the side-chain concn. Results of Valence Effective Hamiltonian calcns. were compared with the exptl. results of thermochromism. A vibronic structure was found in the absorption spectra of Langmuir-Blodgett films at room temp. The vibronic splitting in poly(3-hexylthiophene) was approx. 0.18 eV as previously has been obsd. in poly(3-alkylthiophenes), but in poly(3'-octyl-2,2';5',2"-terthiophene) it was 0.20-0.25 eV. The vibronic peaks stay approx. at const. energies and vanish at elevated temps.

IT 150504-16-8
(thermochromism and optical absorption in Langmuir-Blodgett films
of alkyl-substituted polythiophenes contg. arachidic acid)
RN 150504-16-8 ZCA
CN 2,2'-Bithiophene, 3-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 150504-15-7
CMF C16 H22 S2



IT 150504-16-8
(thermochromism and optical absorption in Langmuir-Blodgett films
of alkyl-substituted polythiophenes contg. arachidic acid)

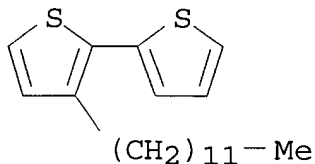
L15 ANSWER 41 OF 51 ZCA COPYRIGHT 2003 ACS
120:299773 Thermochromic Properties of Polythiophene Derivatives:
Formation of Localized and Delocalized Conformational Defects.
Roux, Claudine; Leclerc, Mario (Departement de Chimie, Universite de
Montreal, Montreal, QC, H3C 3J7, Can.). Chemistry of Materials,
6(5), 620-4 (English) 1994. CODEN: CMATEX. ISSN:
0897-4756.

AB Temp.-dependent UV-visible absorption measurements in the solid
state and in soln. have been performed on poly(3-butoxy-3'-decyl-
2,2'-bithiophene) (PBDBT), poly(3-dodecyl-2,2'-bithiophene) (PBT12),
poly(3-(octyloxy)-4-methylthiophene) (POMT), and
poly(3-dodecylthiophene) (PT12). These measurements revealed the
existence of two different types of thermochromism which are
correlated to the substitution pattern of the polymers. A
"two-phase" thermochromic behavior was found in POMT and PT12 and
was related to the formation of delocalized conformational defects
(twistons) upon heating. The formation of such twistons is made
possible by the presence of sterically demanding substituents
between each consecutive repeat unit. In contrast, the partially
substituted structure of PBDBT and PBT12 allows only the formation
of localized conformational defects along the polymer backbone
leading to a continuous and monotonic blue shift of the absorption
max. upon heating.

IT 119889-86-0
(thermochromism of, due to localized and delocalized
conformational defects)
RN 119889-86-0 ZCA
CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9
CMF C20 H30 S2



IT 119889-86-0

(thermochromism of, due to localized and delocalized conformational defects)

L15 ANSWER 42 OF 51 ZCA COPYRIGHT 2003 ACS

120:299558 Novel processable thiophene-based polymers and copolymers and thermally stable electrically conducting compositions thereof. Osterholm, Jan Erik; Vakiparta, Kimmo; Vaekiparta, Kimmo (Neste Oy, Finland). PCT Int. Appl. WO 9402530 A1 19940203, 26 pp. DESIGNATED STATES: W: JP, US; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1993-FI301 19930719. PRIORITY: FI 1992-3304 19920720.

AB The title polymers comprise homo- or copolymers of alkyl bi- or trithiophenes. Doping of the polymers with electron acceptors such as FeCl_3 give compns. with high elec. cond. and good thermal stability.

IT 150504-16-8P

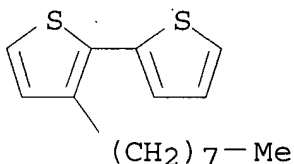
(prep. of, with thermally stable elec. cond. when doped)

RN 150504-16-8 ZCA

CN 2,2'-Bithiophene, 3-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 150504-15-7
CMF C16 H22 S2



IT 150504-16-8P

(prep. of, with thermally stable elec. cond. when doped)

L15 ANSWER 43 OF 51 ZCA COPYRIGHT 2003 ACS

119:181881 Synthesis of soluble poly(alkylthiophenes) which are thermally stable in the doped state. Andersson, M. R.; Pei, Q.; Hjertberg, T.; Inganaes, O.; Wennerstroem, O.; Osterholm, J. E.

(Dep. Org. Chem., Chalmers Univ. Technol., Goeteborg, S-412 96, Swed.). Synthetic Metals, 55(2-3), 1227-31 (English) 1993

. CODEN: SYMEDZ. ISSN: 0379-6779.

AB Poly(3-octyl-2,2'-bithiophene) and poly(3'-octyl-2,2';5'2''-terthiophene) were prepd. showing better stability against thermal dedoping than poly(3-octylthiophene) (I). A redn. of the no. of alkyl side chains in a regular way lead to better space for the counter ion on doping, more planar .pi.-system and a more rigid polymer backbone, compared to I.

IT 150504-16-8P

(prepn. and characterization of sol., with high thermal stability in doped state)

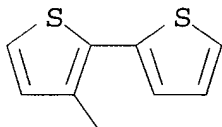
RN 150504-16-8 ZCA

CN 2,2'-Bithiophene, 3-octyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 150504-15-7

CMF C16 H22 S2



(CH₂)₇-Me

IT 150504-16-8P

(prepn. and characterization of sol., with high thermal stability in doped state)

L15 ANSWER 44 OF 51 ZCA COPYRIGHT 2003 ACS

119:181880 The routes towards processible and stable conducting polythiophenes. Pei, Q.; Inganaes, O.; Gustafsson, G.; Granstroem, M.; Andersson, M.; Hjertberg, T.; Wennerstroem, O.; Osterholm, J. E.; Laakso, J.; Jarvinen, H. (Dep. Phys., Linkoeping Univ., Linkoeping, S-581 83, Swed.). Synthetic Metals, 55(2-3), 1221-6 (English) 1993. CODEN: SYMEDZ. ISSN: 0379-6779.

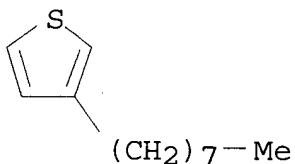
AB The underlying nature of the thermal instability of doped poly(3-alkylthiophenes) is discussed. The thermal undoping is attributed to interactions due to steric hindrance of the long flexible side chains, which twist the conjugated main chain and kick out the dopants. Thus the routes to suppress thermal undoping are to avoid or alleviate the side chain interactions by sepg. the side chains from each other, or from the main chains, and also leaving space around the main chains to accommodate dopants. Accordingly, poly[3-(4-octylphenyl)thiophene], random copolymers of 3-methylthiophene and 3-octylthiophene, and regular copolymers of thiophene and 3-octylthiophene are prepd. Thermal undoping is significantly suppressed in these polymers. Some of these polymers are sol. and fusible in the neutral state. After doping they become highly conductive, yet remain stable even at elevated temps.

Thermochromism, solvatochromism, and thermal undoping are thus all related to side chain mobility.

IT 150321-37-2, 3-Octylthiophene-thiophene copolymer
(thermal stability and elec. cond. of doped)
RN 150321-37-2 ZCA
CN Thiophene, 3-octyl-, polymer with thiophene (9CI) (CA INDEX NAME)

CM 1

CRN 65016-62-8
CMF C12 H20 S



CM 2

CRN 110-02-1
CMF C4 H4 S



IT 150321-37-2, 3-Octylthiophene-thiophene copolymer
(thermal stability and elec. cond. of doped)

L15 ANSWER 45 OF 51 ZCA COPYRIGHT 2003 ACS

119:161481 Studies of structure and conductivity in polypyrrole and poly(thiophene-octylthiophene) grown in microporous membranes. Granstroem, M.; Inganaes, O. (Dep. Phys., Univ. Linköping, Linköping, S-581 83, Swed.). Synthetic Metals, 55(1), 460-5 (English) 1993. CODEN: SYMEDZ. ISSN: 0379-6779.

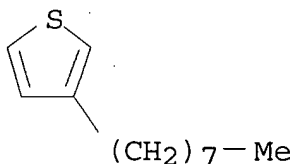
AB The structure and cond. of polypyrrole (I) and thiophene-octylthiophene copolymer (II) synthesized in microporous membranes are studied using x-ray diffraction and elec. measurements. I with 2 different counter ions is electrochem. synthesized in membranes with different pore sizes. The cond. of I in such structures increases compared to bulk cond. X-ray diffractograms show that the crystallinity of I increases with decreasing pore size. The increased cond. is therefore suggested to depend on an increased ordering during the polymn. inside the pores, making the I partially cryst. II also shows an increase in cond. when polymd. in the narrow pores.

IT 150321-37-2
(structure and cond. of, grown in microporous membranes)

RN 150321-37-2 ZCA
 CN Thiophene, 3-octyl-, polymer with thiophene (9CI) (CA INDEX NAME)

CM 1

CRN 65016-62-8
 CMF C12 H20 S



CM 2

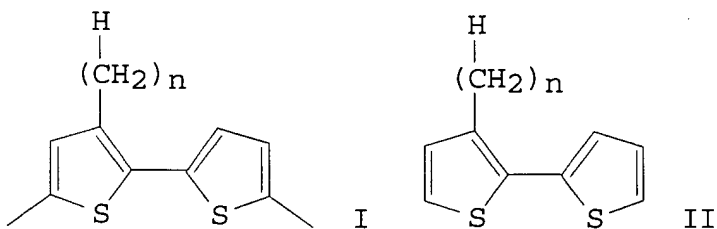
CRN 110-02-1
 CMF C4 H4 S



IT 150321-37-2
 (structure and cond. of, grown in microporous membranes)

L15 ANSWER 46 OF 51 ZCA COPYRIGHT 2003 ACS
 118:31253 Electrically conductive polymers and manufacturing thereof.
 Kaeriyama, Kyoji; Masuda, Hideyuki (Agency of Industrial Sciences
 and Technology, Japan). Jpn. Kokai Tokkyo Koho JP 04106122 A2
 19920408 Heisei, 5 pp. (Japanese). CODEN: JKXXAF.
 APPLICATION: JP 1990-224046 19900824.

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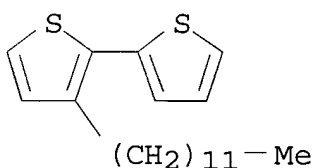
AB The title conductive polymers are polybithiophene described by the
 general formula I ($n \geq 6$) doped with 0.01-0.5 mol.% (based on
 the monomer) of a dopant; the title manuf. involves (1) electrolytic
 or chem.-oxidative polymn. of a bithiophene deriv. described by the

general formula II (n .gtoreq.6) and (2) doping the resulting polymer with the dopant. The dopant may be an anion such as PF₆⁻, AsF₆⁻, BF₄⁻, ClO₄⁻, or CF₃SO₃⁻.

IT 119889-86-0P 141105-21-7P
(prepn. of elec. conductive)
RN 119889-86-0 ZCA
CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

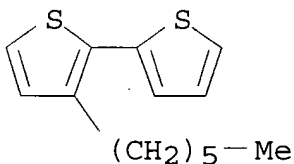
CRN 119889-85-9
CMF C20 H30 S2



RN 141105-21-7 ZCA
CN 2,2'-Bithiophene, 3-hexyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 141102-61-6
CMF C14 H18 S2



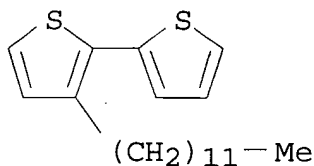
IT 119889-86-0P 141105-21-7P
(prepn. of elec. conductive)

L15 ANSWER 47 OF 51 ZCA COPYRIGHT 2003 ACS
116:215034 Electrochemical polymerization of 3-alkyl-2,2'-bithiophene. Masuda, Hideyuki; Kaeriyama, Hyoji; Suezawa, Hiroko; Hirota, Minoru (Ind. Res. Inst. Kanagawa Prefect., Yokohama, 236, Japan). Journal of Polymer Science, Part A: Polymer Chemistry, 30(5), 945-9 (English) 1992. CODEN: JPACEC. ISSN: 0887-624X.
AB Electrochem. polymn. of 3-(Cn-alkyl)-2,2'-bithiophenes (n = 6, 12) gave conducting films whose elec. conductivities were independent of n. Poly(3-dodecylbithiophene) was more stable in doped states than poly(3-dodecylthiophene) according to soln. spectra.
IT 119889-86-0P 141105-21-7P
(prepn. and spectra and elec. cond. of, electrochem.)
RN 119889-86-0 ZCA
CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9

CMF C20 H30 S2



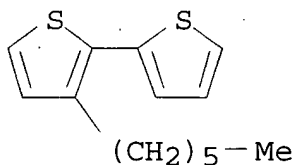
RN 141105-21-7 ZCA

CN 2,2'-Bithiophene, 3-hexyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 141102-61-6

CMF C14 H18 S2



IT 119889-86-0P 141105-21-7P

(prepn. and spectra and elec. cond. of, electrochem.)

L15 ANSWER 48 OF 51 ZCA COPYRIGHT 2003 ACS

115:93074 Comparative study on poly(alkyl or alkoxythiophenes). Kaeriyama, Kyoji; Masuda, Hideyuki; Shirakawa, Hideki; Akagi, Kazuo; Suezawa, Hiroko; Hirota, Minoru (Res. Inst. Polym. Text., Tsukuba, 305, Japan). Polymeric Materials Science and Engineering, 64, 212-13 (English) 1991. CODEN: PMSEGD. ISSN: 0743-0515.

AB 3-Dodecyl-2,2'-bithiophene, 3-(3-phenylpropyl)thiophene, and 3,4-dibutoxythiophene are prep'd. and polym'd. oxidatively using either copper (II) perchlorate, copper (II) tetrafluoroborate, ferric perchlorate, or ferric trichloride. The polymers are characterized by NMR. The conductivities of the polymers are measured.

IT 119889-86-0P

(prepn. and cond. of)

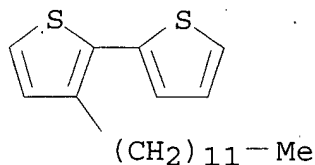
RN 119889-86-0 ZCA

CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9

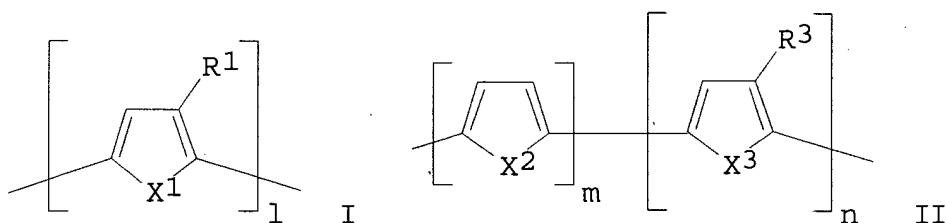
CMF C20 H30 S2



IT 119889-86-0P
(prepn. and cond. of)

L15 ANSWER 49 OF 51 ZCA COPYRIGHT 2003 ACS
114:153757 Heterocycle polymer nonlinear optical material. Kurata, Tetsuyuki; Fuchigami, Hiroyuki; Nobutoki, Eiji; Hizuka, Yuji; Moriwaki, Norimoto (Mitsubishi Electric Corp., Japan). Jpn. Kokai Tokkyo Koho JP 02252728 A2 19901011 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1989-77660 19890328.

GI



AB The material, with high second harmonic generation, comprises .pi.-conjugated polymer I or II (R₁, R₃ = C₁-20 alkyl, alkoxy; R₂ = H, C₁-20 alkyl, alkoxy; X₁-3 = S, NH). Poly(hexylthiophene) showed high second harmonic generation.

IT 112895-24-6
(nonlinear optical material, with high second harmonic generation)

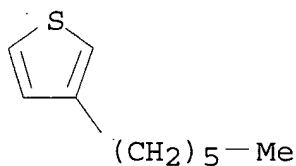
RN 112895-24-6 ZCA

CN Thiophene, 3-hexyl-, polymer with thiophene (9CI) (CA INDEX NAME)

CM 1

CRN 1693-86-3

CMF C10 H16 S



CM 2

CRN 110-02-1
CMF C4 H4 S

IT 112895-24-6

(nonlinear optical material, with high second harmonic generation)

L15 ANSWER 50 OF 51 ZCA COPYRIGHT 2003 ACS

110:164470 Electrically conducting polymeric composite film and method for preparing it. Henry, Francois; Broussoux, Dominique; Dubois, Jean Claude (Thomson-CSF S. A., Fr.). Eur. Pat. Appl. EP 301930 A2 19890201, 7 pp. DESIGNATED STATES: R: DE, GB, IT, NL, SE. (French). CODEN: EPXXDW. APPLICATION: EP 1988-401744 19880705. PRIORITY: FR 1987-10877 19870731.

AB An elec. conductive polymeric composite film is made from a polymer matrix obtained from film-forming macromol. latex (e.g., styrene-Bu acrylate latex or Bu acrylate latex), with a conductive polymer (e.g., of substituted or nonsubstituted thiophene, bithiophene, or pyrrole) diffused in the matrix. Application to microwave-absorbing layers is indicated.

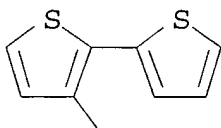
IT 119889-86-0

(elec. conductive composite polymer film contg.)

RN 119889-86-0 ZCA

CN 2,2'-Bithiophene, 3-dodecyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 119889-85-9
CMF C20 H30 S2(CH₂)₁₁-Me

IT 119889-86-0

(elec. conductive composite polymer film contg.)

L15 ANSWER 51 OF 51 ZCA COPYRIGHT 2003 ACS

108:76220 Electrochemical synthesis and spectroscopic study of poly(3-alkylthienylenes). Hotta, S. (Inst. Polym. Org. Solids, Univ. California, Santa Barbara, CA, 93106, USA). Synthetic Metals,

22(2), 103-13 (English) 1987. CODEN: SYMEDZ. ISSN: 0379-6779.

AB Poly(3-alkylthiophenes) were synthesized by electrochem. polymn. carried out under oxygen-free and moisture-free environment. Homopolymers and copolymers of 3-alkylthiophenes with alkyl carbons 4 or more showed elec. conductivities of 1-100 S/cm. Poly(3-methylthiophene) had elec. cond. of 750 S/cm. Polymers with relatively longer hydrocarbon chains showed good soly. in various org. solvents and could be readily processed from soln. both in the neutral and in the conducting (oxidized) form. The influence of the hydrocarbon side chains on the electronic structure of the .pi.-conjugated system of the polymers was discussed.

IT 112895-24-6P

(prepn. and properties of)

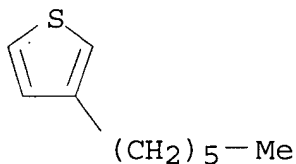
RN 112895-24-6 ZCA

CN Thiophene, 3-hexyl-, polymer with thiophene (9CI) (CA INDEX NAME)

CM 1

CRN 1693-86-3

CMF C10 H16 S



CM 2

CRN 110-02-1

CMF C4 H4 S



IT 112895-24-6P

(prepn. and properties of)